

American

FORESTS

FEBRUARY, 1959

50 CENTS



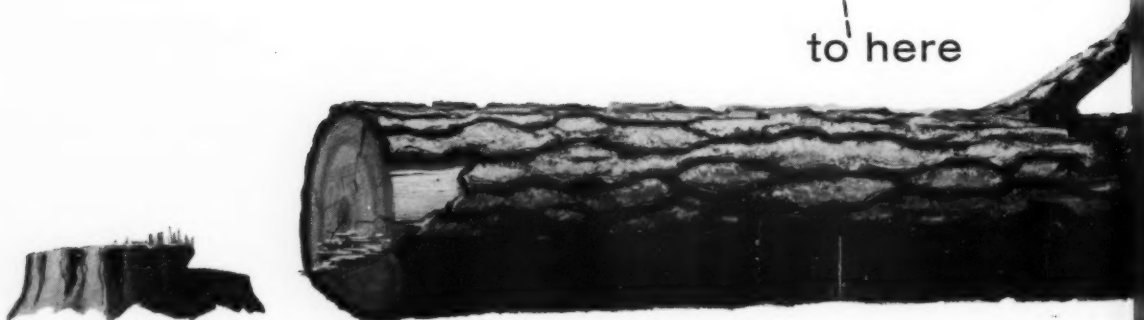
BEETLES IN THE FIR

Shall We Feed Our Forests to the INSECTS?

PAGE 28

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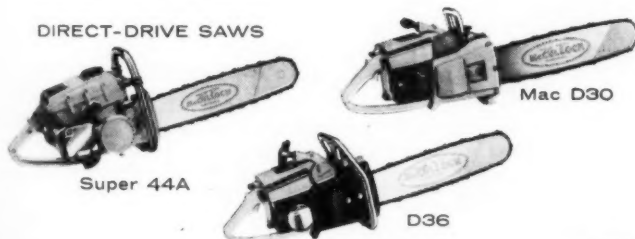
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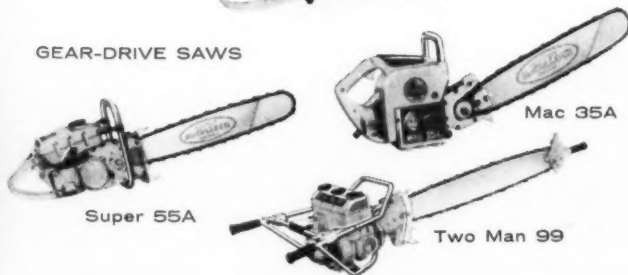
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CHAIN SAWS



Arthur W. Greeley

Greeley Named Assistant Chief

ARTHUR W. GREELEY, regional forester at Milwaukee, has been named assistant chief of the Forest Service. He is succeeded by Marion M. Nelson, deputy assistant chief in charge of national forest resource management in Washington. The transfers are effective March 1.

Mr. Greeley's transfer to Washington is a homecoming for him. He was born here and attended Western High School. In 1944 he returned to the city and worked three years in the Div. of Timber Management, Forest Service.

In his new position he succeeds Howard Hopkins, who retired July 1. As an assistant chief he will help formulate Forest Service policies. He will act for the Chief in matters pertaining to national forest protection and development. Specifically this includes forest fire protection, engineering, land classification and boundary activities on national forest land.

Mr. Greeley has had wide experience in the Forest Service. He started as assistant ranger on the St. Joe National Forest in Idaho in 1935 and worked up through the ranks as forest ranger, assistant supervisor, forest supervisor, assistant director of a forest and range experiment station, and regional forester. His assignments took him to Montana, California, the Pacific Northwest, Alaska, and the Lake States region. He received his BS degree in forestry from the University of Washington and his Master's degree in forestry from Yale.

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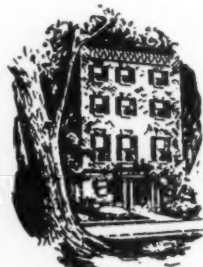
James J. Fisher
Art Director

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COVER • Heavy killing by the Douglasfir beetle in the Willamette River Drainage of western Oregon. More than 3½ billion board feet of timber were killed in this outbreak, which covered some 5 million acres, and lasted from 1951 to 1954.



The AFA

The American Forestry Association, publishers of *American Forests*, is a national organization — independent and non-political in character — for the advancement of intelligent management and use of forests and related resources of soil, water, wildlife and outdoor recreation. Its purpose is to create an enlightened public appreciation of these resources and the part they play in the social and economic life of the nation. Created in 1875, it is the oldest national forest conservation organization in America.

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THROUGH THE HEART OF THE SOUTH

Forest Forum

Porcupine Park

EDITOR:

Because your magazine is one of the few resource publications which presents a very objective approach to a resource use problem, I urge you to investigate and present an article on the Porcupine Mountains State Park situation in Michigan. There seems to be conflicting information concerning the aim of the group desiring to mine part of the area for copper and concerning the values involved within the park boundaries and adjacent areas.

Information in the August 1 issue of *Conservation News* published by the National Wildlife Federation, in the December issue of *Outdoor America* published by the Izaak Walton League of America, and in the December issue of *Nature Conservancy News* published by The Nature Conservancy is vague and very general and seems to be inaccurate and incomplete. It is interesting to note that the material in these three publications seems to be based upon a single source, for the words and statements and opinions are quite the same, if not exactly the same.

The articles referring to the Porcupine Mountains State Park make quite general statements concerning the untouched virgin wilderness aspects, the uniqueness of the area, and the rarity of the wildlife to be protected, plus glowing terms about a sportsmen's paradise.

In response to a recent letter to the Michigan Department of Conservation, I received as a reply: "... the facts in the August 1 issue of *Conservation News* are somewhat distorted and not entirely correct." The writer then went on to say that so far as can be determined a major part of the so-called virgin area was not logged in the early days. However, I would be interested in knowing if the approximately 45,000 acres generally referred to as virgin are actually virgin forests or if there was logging for high-grade white pine or hardwoods in the early days of that area.

The articles referred to made the statement that rare species of wildlife required protecting but did not name the species involved.

The response also stated: "I doubt very seriously that the wildlife includes any rare species, although an attempt was made to introduce pine marten."

"The park will be a hunters' and fishermen's 'paradise' according to the article. I wonder if hunting will be, or is allowed, in a 'park'?"

Another source of reliable information within the state government of Michigan has indicated that a large portion of the mineral rights within the state park are still privately owned and not owned by the state. This source also indicated that the acreage within which the copper mining firm would like to mine, although claimed to be within the so-called virgin area,

actually is in a burned-over area which is not of particularly desirable wilderness quality. In addition, this source indicated that the region is one of chronic unemployment and low general income requiring much public welfare support.

The articles suggest that the disposition of refuse from mining operations would pollute Lake Superior if it were disposed of there. Exhaustive studies of the disposal of materials from iron ore refinement at Silver Bay, Minnesota indicated that the lake currents there would take the materials down into a deep trough and that there would be little or no lateral movement and no pollution. Could this also be true of the mining operations under discussion?

I have no personal interest in the Porcupine Mountains State Park or in the differences of opinion concerning its use and management, but I would like to be able to pick up a publication and be able to accept the facts as true and as being objectively reported. This has been almost impossible in the Porcupine Mountains State Park situation. I would welcome an article in your magazine attempting to clarify the matter.

Howard A. Post
4416 N. Henderson Rd.
Arlington 3, Virginia

(One of the best-documented articles to date on this subject is Dr. S. T. Dana's report "The Porcupines . . . Time of Decision" in the January issue of *Outdoor America*. In weighing the pros and cons of the argument, Dr. Dana found that the state's Economic Development Department found that an urgent need exists for additional industry in the Porcupine area and that mining apparently was the only answer. At the same time, the Tourist and Resort Service of Michigan State University found that tourism brought 14 million dollars plus to the area in 1957 and that at the present rate of increase this will amount to 28 million by 1970 and 65 mil-

1959 Annual Meeting

"People and Resources — A Problem of Co-Existence" will be the theme of the 1959 Annual Meeting of The American Forestry Association, October 11-14 at Bedford, Pa. Lloyd E. Partain, president of the Pennsylvania Forestry Association and a regional vice president of AFA, will be general chairman. Thus the oldest active state forestry group in America will join forces with the oldest national forestry association in jointly sponsoring the 84th annual meeting, in a state with a fine forestry heritage. Dr. Ralph Marquis, Forest Service, will be program chairman.

lion in 2007. The expansion of tourism appears to be a pretty safe bet, the article shows, while the argument for mining presents several "weak spots," and "iffy" questions. In adding up his conclusions, Dr. Dana identifies himself with those individuals who believe that the industrial development possibilities would constitute only a stop-gap measure of doubtful efficacy which would unjustifiably impair the value of the park and would set an unwelcome precedent that might in time threaten the entire park system. With the issues sharply drawn, the Michigan State Conservation Commission last month was scheduled to present a verdict when the mining firm applying for a lease in the park suddenly withdrew it. — Editor)

Senator Proxmire's Invitation

EDITOR:

Your "Washington Lookout" department by Albert G. Hall is in error in stating, in your December, 1958 issue, that the Senate Select Committee on Small Business hearing in Superior, Wisconsin on November 13, was held "to generate support for" legislation to establish a program of price reporting for forest products. Actually, the hearing was called to gather information on a full range of the problems which confront small businesses in the forestry industries. And, as a matter of fact, the testimony in the hearing produced a good deal of information about a number of problems in addition to any that might conceivably be affected by the price reporting proposal.

In order to clarify this matter, I would sincerely appreciate your publishing my invitation to each member of The American Forestry Association to write for a copy of the hearings record and the committee report, which will be printed and available by now or shortly.

Copies can be obtained on request from the Senate Select Committee on Small Business, Senate Office Building, Washington 25, D. C. This is the first time that such a complete analysis of the independent forestry industry has been presented, and I'm sure members of your important association will appreciate full coverage in your magazine as well as an opportunity to study the full proceedings of the hearing.

In regard to the proposal I have made for pilot studies of the new developments in utilization of low-quality northern hardwoods for newsprint production, your readers may be interested to know that this proposal was first advanced by the Commission on Increased Industrial Use of Agricultural Products, which was appointed by President Eisenhower. Both the "Welch

(Turn to page 62)

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Forty-four forestry, industry and conservation leaders met last month to plan Fifth World Forestry Congress for the summer of 1960



Dr. McArdle presides at planning session at State Department. To his right is Dr. I. T. Haig, secretary of the Congress' organizing group

5th WORLD FORESTRY



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Top industry men to play prominent role. Front row, l. to r., Wagner, Veach, Mason and Bromley. Rear, Dunn, McCaffrey, Stamm, Doyle, Heacox and Amidon

Fifth congress, the first in this country, will be staged on the University of Washington campus at Seattle. Spanish, French and English will be spoken. Two thousand may attend.



Gathered under Congress seal are Chief Forester Pomeroy, AFA; Corydon Wagner, who attended India congress; Vice President E. P. Stamm, of AFA; and Chairman McArdle, Forest Service Chief



FORESTRY CONGRESS

TWO thousand foresters from eighty-two countries are being invited to attend the Fifth World Forestry Congress, to be held in Seattle, Washington during the summer of 1960. (See Editorial, page 11.) Dr. Richard E. McArdle, chief of the Forest Service, is chairman of a 44-man committee from forestry and forest industry that will plan and organize the affair. Dr. I. T. Haig, former director of the South-eastern Forest Experiment Station and more recently in charge of tech-

nical forestry activities for FAO, in Rome, Italy, has been appointed executive secretary of the organizing committee.

Members of the committee are: George B. Amidon, Director of Woodlands, Minnesota and Ontario Paper Co., International Falls, Minn.; Kenneth E. Barraclough, Extension Forester, University of New Hampshire, Durham; Roy Battles, National Grange, Washington, D. C.; Paul W. Bedard, Office of Food and Agriculture, International Coopera-

tion Administration; Willard S. Bromley, Executive Secretary-Treasurer, American Pulpwood Association, New York, N. Y.; Charles C. Butler, American Farm Bureau Federation, Washington, D. C.; Charles H. Callison, Natural Resources Council of America, Washington, D. C.; Whitford B. Carter, Los Angeles Watershed Commission, Los Angeles, Calif.; Fred H. Claridge, President, Association of State Foresters, Raleigh, N. C.; Henry Clep-

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Forester's Notebook

By KENNETH B. POMEROY

FOREST conservation embraces a multitude of seemingly unrelated activities. Yet all are tied to a central core of protection and wise use of natural resources. Some facets require immediate attention, while others are only of passing interest. A random sample of current events provides an estimate of the breadth and variety of forest conservation.

Fire Protection

Protection of interior Alaskan forests from fire will receive a sharp setback in 1960 if Congress abides by Budget Bureau action in halving funds for the Bureau of Land Management.

BLM has been and still is responsible for the protection of 225,000,000 acres of forest land in Alaska. But the new state will receive 103 million acres during the course of the next 25 years. Pending such a transfer, the lands should continue to be protected.

Federal budget planners, however, have taken an attitude of "why protect something the state will acquire." They cut back BLM's 1960 program to 1957 appropriations.

In that year, 1957, five million acres of Alaskan forests burned over. In some instances, the fires burned so deeply into the soil that centuries must pass before the vegetation can be restored.

In 1957, BLM protection forces in Alaska numbered twenty-one men—one man for each 10.7 million acres. Detection facilities were grossly inadequate. One warden's first knowledge of a fire came in a letter mailed seven days previously. The sender wrote, "I think it's about 40,000 acres."

The means of suppression were equally meagre. There were too few base camps and inadequate transportation. Prompt attack on new fires was often impossible. Just as frequently there were not enough experienced fire bosses to man all fires.

During the winter of 1957-58, a number of national conservation organizations, led by The American Forestry Association, urged Congress to provide fire protection in keeping

with the values at stake. Congress appropriated \$250,000 for construction of base facilities and the procurement of modern detection and communications equipment.

This investment, intended to be the first installment of a planned five-year improvement program, paid handsome dividends. The average loss per fire in 1958 was only one-tenth that of the previous year, although weather conditions continued to be very hazardous.

Then came statehood and the present view of the budget planners.

The net effect of their pencil sharpening will wreck preseason recruitment and training, eliminate a much-needed smokejumper program, curtail equipment of fire-guard outposts, and restrict the use of aerial tankers in fire suppression.

Such a shortsighted policy fails to recognize the public's stake in all natural resources. If the forests are devastated, recreation, hunting, wilderness enjoyment, and a host of other forest uses become impossible. Protection is a basic need.

A comprehensive program for fire protection in Alaska, including a plan for orderly transfer of responsibility to the new state, should be presented to Congress. Meanwhile, all the lands, both those for ultimate transfer to the new state and those to remain in federal custody, must be protected.

Public Land Grab

Numerous speculative land schemes, bordering on the fraudulent, were nipped in the bud last December when the Bureau of Land Management rejected 1100 applications covering one-third of a million acres of desert land in California.

The Desert Land Laws, passed in 1877, provide for the disposition of arid lands to settlers who irrigate them and bring them under cultivation. Such development may involve total expenditures of \$20,000 to \$50,000 to prepare the land for farming.

In rejecting the applications, BLM Director Edward Woosley said, "It is apparent that some people have attempted to obtain land under the

Desert Land Act when they have no intention of using the lands for agricultural purposes."

Many of the applications were filed by land locators who charged their clients from \$2 to \$10 per acre for their services. Frequently there was no evidence that the applicants had any personal knowledge of the land applied for or its capabilities for irrigated agriculture. They were enticed into the speculation by alluring advertisements in the Los Angeles newspapers.

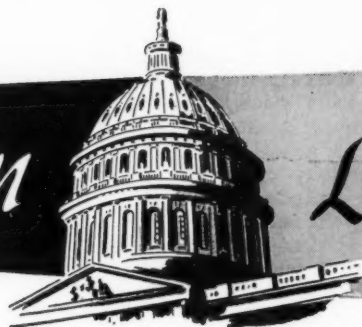
In an earlier action, Director Woosley took sharp issue with a free-lance writer over "Uncle Sam's Great Land Give-Away" as it appeared in a popular magazine. This article sought to encourage the public to "stake" and occupy mining claims on public lands for the purpose of obtaining valuable and desirable sites for vacation retreats and a "weekend paradise."

"The fundamental idea behind this article—that Uncle Sam 'gives away' land—is false," said Mr. Woosley. "There are no 'free' lands available from the federal government—not for any purpose. The author's own statement that it is necessary to perform \$100 assessment work per year on mining claims refutes this notion. The minimum costs of obtaining fee simple ownership to a mining claim include: (1) \$500 in improvement work, plus (2) a \$10 filing fee, plus (3) either \$2.50 (placer claim) or \$5.00 (lode claim) per acre, plus (4) other expenses varying from \$100 to \$1,500 per claim. These are minimum amounts and do not include larger investments in mining equipment and operations which miners may make.

"People who want to obtain small tracts of public lands for recreation and residential purposes have an opportunity to do so under a law known as the Small Tract Act. This law authorizes the government to sell or lease small tracts of vacant public land up to five acres for residential, recreation, and business purposes. This law does not apply to reserved

(Turn to page 57)

Washington



Lookout

By ALBERT G. HALL

DEADLINE BRIEFS: Full speed ahead on Operation Outdoors and Mission '66 programs urged by AFA's Board of Directors at its January 19 meeting. Keep both programs on schedule with no cutbacks, the board recommended. Restoration of budget item for Alaska fires, cut off at pockets by new budget, also urged by board. Reinstatement of \$2,500,000 for structural improvements on national forests was recommended by the board because "the well-being of our national forests is at stake here." . . . In Florida, Forest Industries Council perturbed by continuing confiscation of land by government agencies, particularly Defense. No telling where it will all end unless the steady drain is stopped, top business men declared. . . . Using the Battelle Institute Report, state foresters plan to campaign for full 20 million dollars for fire programs, and will also fight to restore half million cut for tree planting.

STRONG WESTERN MEMBERSHIP BEGINNING TO BE FELT IN AFA? Don P. Johnston, who some say is the best president AFA ever had, started his eighth term in January, but more interest in D. C. centered around the election of Edward P. Stamm, of Portland, Oregon, to vice presidency. He succeeds Dr. Wilson Compton, who continues on the board. Who is Stamm, some are asking. Former Crown-Zellerbach v.p. who built up and directed that firm's efficient tree farm program; mainly responsible for AFA's Northwest meeting several years ago; called the Tillamook "snag snatcher" by westerners for his one-man campaign to eliminate dead snags as worst menace to Northwest forests. AFA Treasurer Jack Christie, of Riggs Bank, informed AFA board that 1958 was its most successful year in history on the economic front. Big gains. With entire building renovated from top to bottom, the association will next go to four-color covers for American Forests. Big portrait of T.R. from Theodore Roosevelt Association and handsome blowup replica of Forest Conservation Stamp in lobby symbolize gains on other fronts. People in Washington are saying President Johnston deserves much credit for continuing AFA progress.

A HEMISPHERIC CONFERENCE ON MANAGEMENT OF RENEWABLE NATURAL RESOURCES for tourism and recreation is being stimulated by the Natural Resources Council, an organization composed of 38 national conservation groups. No date or place for the conference has been suggested. Tentative plans call for bringing together representatives of the nations of the Western Hemisphere to discuss needs and objectives, to exchange scientific, economic, and educational data and experience relating to mutual problems of conserving and managing renewable natural resources for purposes of tourism and recreation. The idea stems from the interest of the Natural Resources Council and the Department of the Interior, custodian and manager of the national parks and monuments and of the lands of public domain. If the proposed conference is authorized by Congress, it is expected that the NRC and the Department of the Interior, and other federal agencies, will work together in the planning and conduct of the hemispheric meeting. It is also understood that Congress may be called upon to assist the financing of the conference through appropriation of funds.

THE NATURAL RESOURCES COUNCIL, WHICH PASSES NO RESOLUTIONS, adopted a resolution at Tucson, Arizona, endorsing the proposed conference over the protests of The American Forestry Association. While sympathetic to a hemispheric conference, James B. Craig, representing the association, urged that the resolution stipulate that the conference be held "after 1960," so as not to conflict with the first World Forestry Congress ever to be held in America, also set for 1960. On the basis of five years of planning that has gone into the World

(Turn to next page)

Forestry Congress, Mr. Craig raised the question as to whether a worthwhile hemispheric meeting could be done well in either 1959 or 1960. With a number of organizations already committed to the hilt to the Forestry Congress, he pointed out, many groups that would like to participate in a hemispheric meeting would be unable to give it their full help until after 1960. However, the council voted unanimously to back the conference with no time stipulations whatsoever, with The American Forestry Association opposing it on the basis of the views outlined here. The Society of American Foresters severed relations with the council immediately thereafter. AFA weighed the merits of following the Society's suit, and decided that while this particular action by the council was unfortunate, that in the main the wise things done by the council outweighed the unwise things, and elected to remain a member. Then too, AFA decided few organizations would last long if all members pulled out the first time the majority outvoted them.

EARLY ACTIONS OF THE CONGRESS indicate that it may be a bit more conservative than might have been expected as a result of the November elections. There are also indications that the leadership of both parties is showing increasing awareness of the need to halt inflationary trends in public spending. Although a large number of spending measures have been introduced in the first two weeks of the 86th Congress, it is now believed that few of them will be considered seriously, and that an attempt will be made to balance the budget.

AMONG CONSERVATION ISSUES FACING THE CONGRESS, water conservation and development measures will probably receive the most serious attention. Water, of itself, is important, but the interest in water projects will be further stimulated by recreation and wildlife interests, by advocates of public power, and by attempts to relieve local unemployment through the placing of projects in "distressed" areas. Two bills of major importance affecting water resource development have been introduced by Representative Trimble of Arkansas. One, H.R. 8, proposes a national policy for basin-wide development; the inclusion of all benefits, both tangible and intangible, in planning and evaluation of proposed projects; and inclusion of uneconomical features in project plans providing the entire project shows a benefit-to-cost ratio of more than unity. The other measure, H.R. 290, would make the evaluation of recreational benefits and wildlife development resulting from the construction of any flood control, navigation, or reclamation project an integral part of project planning. It also proposes a formula for weighing recreational benefits: computing the monetary value of recreation at one dollar per visitor day, based on the anticipated number of visitors on any day multiplied by 365. Similar bills have been introduced by other members of Congress. Either of these measures would have the effect of making recreation a deciding factor in the planning and approval of some water development projects that otherwise might not be justifiable. The first bill, H.R. 8, would also encourage the inclusion of public power projects in dams that might be needed for flood control or water conservation.

A SOMEWHAT NEWER VERSION OF THE WILDERNESS PRESERVATION BILL has been introduced in the House, by Representatives Baldwin and Miller of California, O'Hara of Illinois, Reuss of Wisconsin, Metcalf of Montana, Saylor of Pennsylvania, and McGovern of South Dakota. It is expected that others will introduce similar bills. Following the hearings held in the West during the past fall, the Wilderness Bill language has been changed a bit to meet some of the objections. The objective remains the same: To establish a National Wilderness Preservation System under which wilderness areas would be set up by Congressional action rather than by administrative action of the land-managing agencies. The new bills still retain the proposal for a National Wilderness Preservation Council to serve as a clearing house for wilderness information, to make surveys of wilderness needs and conditions, and to report annually to the Congress.

ESTABLISHMENT OF PUBLIC USE OF THE NATIONAL FORESTS as a policy of Congress, a perennial proposal to stimulate greater development of national forests for recreation and wildlife, is included in a bill, H.R. 248, by Representative Price of Illinois. It would authorize the appropriation of 10 per cent of national forest receipts, up to a maximum of \$10,000,000 annually, for wildlife and recreational development, and would authorize the charging of fees for use of improved recreational areas in the national forests. While the earmarking of receipts probably will not be acceptable to the appropriations committees, the bill, and others likely to be introduced, will doubtless result in more attention being paid to recreation and wildlife development.

Forestry In The Big League

American forestry last month was moving into the Big League of international relations. The scene was a spacious State Department conference room. Gathered at a big round table, each man with his own individual microphone just like the United Nations, were 44 representatives of forestry and forest industry appointed by the Department of State to plan and organize the Fifth World Forestry Congress for the summer of 1960, the first ever to be held in our country.

At that time, up to 2,000 foresters from possibly 82 foreign countries will congregate on the University of Washington campus at Seattle for a high echelon technical conference on the theme, "Multiple Use Forest Management." Dr. R. E. McArdle, chief of the Forest Service, is chairman of the committee that will draft the congress program, make plans for forestry tours, arrange for housing, and raise money. Previous congresses were held in Rome, Italy; Budapest, Hungary; Helsinki, Finland; and Dehra Dun, India. We hope to make the American congress one of the best, and as *American Forests* went to press the committee had named key committees and was already in high gear.

Should AFA members plan to attend this congress, some have already asked. The answer is "probably not," although some engaged in technical forestry and conservation work might wish to do so. As Chief McArdle stressed, this will be a technical congress world-wide in scope and not necessarily the type of meeting that even interested laymen might wish to attend, or get too much out of if they did. Actually, the meeting represents a sounding board for some of the best technical brains in the world, and as such presents a ready-made platform from which to trumpet the virtues of the multiple-use forest management in which we all believe. Most of us can best help by hitting that key as hard as possible. Members who might feel their attendance is still desirable should contact Dr. I. T. Haig, U. S. Department of State, Washington 25, D. C., for more information.

What sort of people will attend the congress, where will they be from, and how will they stack up with forestry personnel in our own country, others have asked. Guests will be from both outside and inside the Iron Curtain, with the exception of Red China. Some of them will be experts, with world-wide reputations, and all of them will be the top men from the countries they represent. Some of the countries to be represented have forestry programs that surpass ours in a few respects, particularly in silviculture. Others will not be so far along. To these experts, American programs are likely to present a picture of forestry in transition. That Dr. Haig is correct when he says that most of the visitors will be

keenly interested in our multiple-use concepts would appear to be borne out in the article by Walter Mann, of Germany, starting on page twelve of this issue. Interest will also be keen in American equipment and examples of engineering know-how, Dr. Haig believes.

Is there a chance that this conference may contribute, at least indirectly, to the cause of world peace, others have asked. That is the sincere hope, but the State Department stresses that Americans themselves have certain obligations. Harry V. Ryder, Jr., of the department said, "These technical gatherings help build good will for our country, but nevertheless there *are* certain 'subtleties' to be observed."

This is a nice way of saying that we should show restraint in dealing with our guests, avoid extravagant overstatements about how good we are, and soft-pedal the tendency inherent in our highly competitive society to resort to the Madison Avenue idiom. One critic who thought planners were belaboring this point asked, "Does this mean we shouldn't be ourselves, and should avoid showing these people all the things in which we are interested?" The answer is, not at all. As translated even more succinctly by Publicity Chairman Clint Davis, Mr. Ryder's comment simply means, "Be a gracious host," and all that the term implies.

This is something all of us, North, East, South, and West, can readily understand. We all delight in inviting people into our homes and showing them those things of which we are proud, including our wives, our children, or our gardens. At the same time, we take care not to brag or boast too much, even if we do think they are pretty good. People wouldn't consider it in good taste and it would most likely be misinterpreted.

That's all that is involved here, except that in this case the stakes are pretty high. Friendly naturalness is the ticket here, and while it may tax some of us severely to maintain this posture in the event certain of the guests start extolling their many reputed "firsts," nevertheless, in this case, it is to our advantage to do so. We believe we should regard this congress as a challenge. In our favor is the fact that interest in trees knows no boundaries, bows to no ideologies. But we should follow the lead of the State Department on some of these other matters, because that is their business. As we say, American forestry is moving into the Big League in this particular venture, and when you are in the Big League, whether you are Joe DiMaggio or John Foster Dulles, there are certain things you do and there are certain things you don't do.

So let's all act like Major Leaguers!

German Notes U.S. Forest

Uses for Fun

OGDEN — Forestry in Germany is concerned only with the production of timber, particularly for industrial use in the United States. We are concerned with conservation, protection of production of wood.

THIS WAS T
Tuesday of Ministerial Director Walter Mann, chief of German forest service, is visiting in Ogden. He is accompanied by Reed W. Bailey, regional forester of the mountain region.

German Forestry Chief Will Pay Ogden Visit

Ministerial Director Walter Mann, federal forestry chief for western Germany, will visit Ogden this week as part of a trip through Idaho. He is accompanied by Reed W. Bailey, regional forester of the mountain region.

W. German Forest Chief Visits Ogden For Study

OGDEN—West Germany Federal Forestry Chief Walter Mann arrived in Ogden Monday in company with Richard E. McArdle, chief forester of the United States. Ministerial Director Mann is making a study of the forest areas of the mountain region.

Forest Office Of Europe Visits Region

Special to The Tribune
OGDEN—The chief of forestry of Western Germany will visit Ogden Monday to tour some of the forest areas of the mountain region.

Distinguished foreign visitor discovered
new concept in American way of
life, which he believes is our best
contribution to welfare of mankind

America's

Mr. Mann toured Yosemite National Park with (left) Wolfgang Koehler, Forestry Attache, German Embassy, Walter Puhn, superintendent, Cleveland National Forest, Russ McRorey, Forest Service, John Preston, National Park Service, Richard E. McArdle, chief, Forest Service, and Walter Mann



Top German Forester Visits Utah

West Germany's top forestry official said today he will attempt to increase the recreational use of Germany's forests as a result of information gained on a tour of forests in the United States. Walter Ministerial Director Mann said he has been impressed by the emphasis U. S. foresters place on recreational use of forest lands in this country. He said he has noticed that the primary task of U. S. foresters is to preserve forests for the people while the primary emphasis in Germany is product.

German Visitor Impressed By 'Public' Forest

OGDEN — "Everyone in the United States Forest Service regards preservation of the forest for use of the people as his most important job. I'll take this back to Germany as my strongest impression of U.S. forestry," Walter Mann, ministerial director of forests in West Germany, told a press conference.

EXTENSIVE TOUR
Mr. Mann, federal forestry chief for West Germany, visited Ogden today as part of a five-week trip through U. S. forests as a guest of the State Department. He was accompanied to Ogden by Richard McArdle, chief of the U. S. Forest Service, and Wolf-

Mr. McArdle said Mr. Mann has noticed the forestry gives of forests, mountains forest and an immense of lives.

Davis Water, Play Projects Win Forests Chief's Praise

BOUNTIFUL—Davis County watershed and recreation development Tuesday were heralded as examples of what can be done with full public support of a project.

RICHARD McARDLE, chief of the U.S. Forest Service, inspected the Buckland Flats area in the Wasatch Mountains east of Bountiful and told city and county officials that if the U.S. Forest Service enjoyed the support throughout the nation that had been displayed in Davis County, the forested lands of the nation would be a more valuable natural resource. Mr. McArdle cited the cooperative efforts of the county and Forest Service over the past 20 years in reforestation and recreation.

The Forest Service chief and the ministerial director of forests for West Germany, Walter Mann, joined local foresters for an inspection of the Buckland Flats development.

They were met by city, county and Chamber of Commerce officials.

Mr. McArdle said he wanted Mr. Mann to see the projects in the Wasatch Mountains because they best demonstrate the products of co-operative efforts between communities and the Forest Service.

Commenting on German forestry techniques, Mr. Mann explained that a much smaller percentage of German forests

OTHER FACE

By **WALTER MANN**

Chief, Forestry Division
Federal Ministry of Food, Agriculture and Forestry
Bonn, Germany

NOTHING provides more real pleasure and satisfaction than traveling with an open mind. Foresters, as well as anyone else, must be constantly alert in order to determine a country's many distinctive characteristics, and to detect underlying causes and motivations. When meeting this same attitude in a foreign country you will feel at home instantly, as a warm understanding develops immediately between you and the country's people.

This attitude was apparent upon my arrival in Washington, D. C., when on May 28, 1958, The American Forestry Association and the Society of American Foresters invited me to a luncheon at the Cosmos Club with a distinguished group of American foresters. Not only on this occasion, but wherever I traveled throughout the United States—from the Atlantic to the Pacific Oceans, from the exotic plains of Florida to the lonely peaks of the Rocky Mountains—I met the same hospitality and helpful guidance, and the same friendly people everywhere.

The impressions gathered on this tour I will never forget.

Most of the credit for my well-planned itinerary should go to Dr. Richard E. McArdle, chief, U. S. Forest Service. Dr. McArdle planned a trip which was an ideal combination of forestry, natural beauty, forest products industry, wilderness, desert, and abundance in this country. In addition, the tour made it possible for me to meet a fair cross-section of American people, and I will always remember what I learned while talking to them.

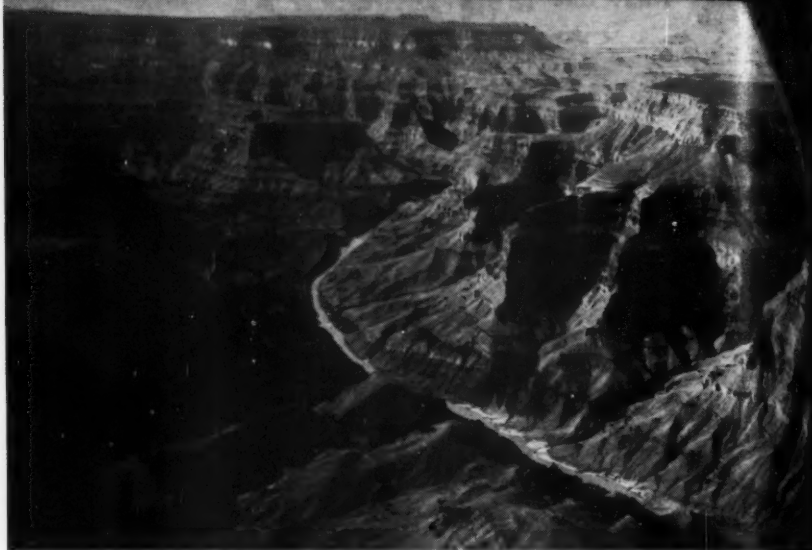
Dr. McArdle, who accompanied me during most of the trip, was an excellent interpreter of American history and everything of national or local significance. Therefore, I regard it a fair tribute to express my sincere feeling of gratitude once again. By the same token, this appreciation extends to all Americans I met—people in industry and research, state foresters, Forest Service personnel, Park Service rangers and superintendents, journalists, members of university faculties, and many

others. All of these had in common a real dedication to their professions, great skill, and a remarkable proficiency and deep understanding for what you might call the other side of the coin. What had begun at the Cosmos Club became more and more a heartwarming reality as time passed by.

Through my travels I learned the meaning of the American forestry concept, and how a dream, visualized some fifty years ago by a small group of pioneer conservationists, became a reality. For the first time I became aware that in an American forester's regular activities, recreation and watershed management may take priority over what we regard as a German forester's daily bread—that is cruising, tree marking, supervision of logging operations, and other activities. Furthermore, I became cognizant of the many physical strains our American colleagues must endure while performing their hard, daily work on many national forests, especially in the western mountains. Above all, however, they regard as their basic



Messrs. Koehler and Mann witnessed all phases of American forestry on tour



The spectacular Grand Canyon and other natural wonders of the United States were shown to the German guests. Their extensive trip stretched from coast to coast



Logging operation in Arizona was included in the itinerary. Here the foreign visitors examined the Allen Lake log landing on the Coconino National Forest

W. L. "Slim" Hansen, Watershed Management and Information, explains Beaver Creek project. Mann was impressed with forest management for multiple use



principle the famous statement on the Forest Service's conduct: *Where conflicting interest must be reconciled, the question will always be decided from the standpoint of the greatest good of the greatest number in the long run.*

During the rare idle hours on my trip, and later upon my return to Germany, I tried to compare our two countries. In the beginning this was not easy, because the United States, leading in the field of mechanization and technical development, the country of atomic energy and automation, has another face too.

Evidently the American people are trying to reconcile restlessness with calmness by replacing materialism with a sort of romanticism. In other words, they are attempting to change a way of living entirely devoted to business to one closer to nature. Therefore, millions of Americans have found their way back to the mountains and forests, parks and lakes, wherever natural, undisturbed beauty had been preserved. Hunting and fishing, hiking and other outdoor activities are becoming more popular every year. Promoting this idea is a contribution to the welfare of mankind, far superior to anything else counted in terms of money and profits.

Time passed quickly while I travelled from coast to coast, meeting friendliness and understanding everywhere. But on the other hand, I was in the United States long enough to learn an important lesson which I was determined to bring back to the foresters in Germany: That I ought to report on this other face of Amer-



A picnic luncheon was served at the Chevelon Ranger Station on the Sitgreaves National Forest. Foresters welcomed opportunity to discuss their operations

ica, which is different from the rubberstamp pattern many Europeans bear in mind; and to crusade for the idea of reconciliation of men with nature, and for greater emphasis on a multiple use program in German forestry.

A fine occasion presented itself for such a beginning. Early in September 1958, the German Forestry Association (Deutscher Forstverein) had scheduled its biannual meeting in Hanover, attended by more than 1000 foresters, and I was asked to address this distinguished audience. I discussed the image of America I had become acquainted with during my trip in the following way:

A short while ago I returned from a generously planned forestry study tour in the United States. It seems appropriate, therefore, that I try to draw comparisons between conditions there and in the Federal Republic—particularly in regard to forestry policy, organization, and forestry philosophy. I believe one should not discard forestry developments in the United States with just a shrug of the shoulder. Rather, I am of the opinion that we Germans have good reason to take them most seriously.

Comparisons between the United States and our country are, to be sure, particularly difficult. One reason is that Germany is a "Volk ohne

Raum" (a people needing space), in contrast to the United States. Another reason is that as far as forests are concerned, the people, the government and the Congress — let alone the foresters themselves — in the United States place the beneficial effects of the forests much higher than the purely commercial aspects.

In administering federal forests, the Forest Service is not obliged to be financially profitable. It even happens, and not infrequently, that Congress appropriates more funds for certain projects than the Government had asked for. These funds, however, have been put to good use, especially for forest research. Ever-increasing funds have been appropriated which permit the numerous experiment stations and experimental forests to carry on thorough research in the fields of watershed control and management, behavior of various tree species, and forest genetics, and to put many of the findings into practice. This is particularly true of the Forest Products Laboratory which, for the past fifty years, has occupied a leading position in this field throughout the world. The funds appropriated have also contributed to the impressive gains in preventing forest fires. Less than 25 years ago, these forest fires had disastrous effects and destroyed vast areas. For the equivalent of about 12 cents per acre, a remarkably low amount compared with German conditions, an exemplary organization so successfully controlled a

(Turn to page 45)

Smokejumper activities were investigated by visitors. (Left) Mr. Mann, Consul General van Tets of Netherlands, Smokejumper Hammond, Mrs. van Tets, Mr. Koehler



Mrs. Fred H. Kennedy, wife of regional forester for the Southwestern Region served typical western meal to group

By C. J. OLSEN

The proposed invasion at

MT. WHEELER

NATIONAL PARK
BOUNDARY LINE
HUNTING PROHIBITED

THE opinions expressed in this article are concerned with a fundamental issue in land management policy, and are addressed therefore to all readers. However, they are addressed even more pointedly to Nevada residents—so many of whom I know, and so many of whom I claim as warm friends—because it is they who will be most directly, and most seriously, affected if a bill scheduled for presentation in the forthcoming session of Congress is enacted into law.

The bill I refer to is designed to create a national park out of the Mt. Wheeler area in the Snake Division of the Humboldt National Forest in Nevada.

The proposed park area was described in *Nevada Highways and Parks* (No. 1, 1958) by Weldon F. Heald. Mr. Heald wrote that the area contains "... a characteristic kind of western scenery now lacking in the Park Service that should be added while there is still time."

All readers in any degree interested in the proposal itself are urged to re-read these words, because they represent a widespread attitude affecting land management that seriously needs refutation. My efforts to refute it are directed against the attitude itself, not against Mr. Heald, nor against others who I am sure sincerely believe it would be wise to create a national park of the area named.

The implication in any such words as those quoted—however well meant—is that unless this area is added to the national park system "... while there is still time," it will be deplored of its scenic and recreational

beauties, and its most essential values will be lost to the people. Of necessity, too, the implication is that the interests of John and Jane Citizen, whether of Nevada, Michigan, or elsewhere, are to be properly served only if such areas are given national park status and subjected to the limited-use practices in national park lands.

I am fully aware that existing national parks—especially the more spectacular and inviting ones—are heavily used, and are becoming more and more heavily used each season, and that new park areas are needed. I should like to make it emphatically clear, too, that I am in no way opposed to the existence of national parks; neither am I necessarily opposed to the policies under which areas that should be national parks are administered. What I am op-

posed to is the easy assumption that the Wheeler Peak region in Nevada, or any similar region elsewhere, can serve public interests best if given the "national park" label and withdrawn from all but scenic and recreational use.

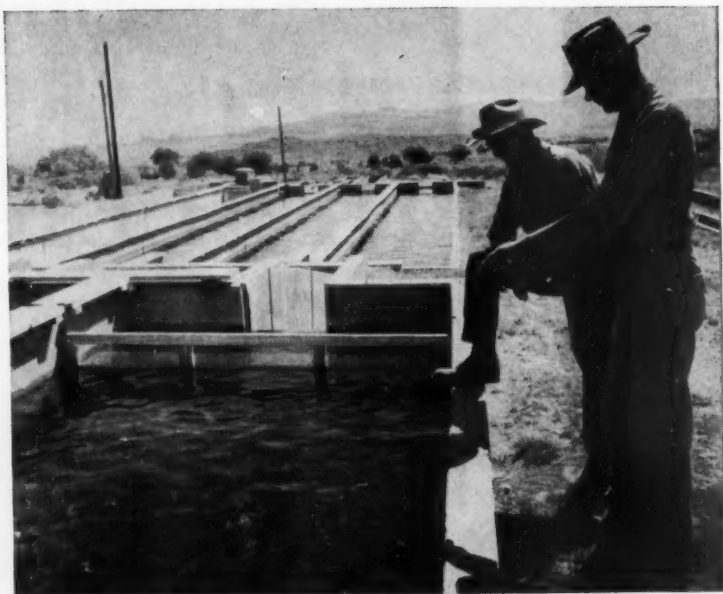
To *preserve* is often necessary, but to *conserve* is often far better. To maroon certain highly valuable and critically needed resources in any state by circumscribing them with national park boundaries may be equivalent, not merely to locking up such resources, but to throwing away the key.

Let us examine the facts as thoroughly as possible.

The proposed national park boundaries would include Mt. Wheeler and adjacent lands totaling about 75,000 acres. Adjoining this area is a tract about one mile square, al-



Aerial view of Mt. Wheeler reveals clearly etched, prehistoric "finger marks." Just below lies the perennial snow field protected by a cirque

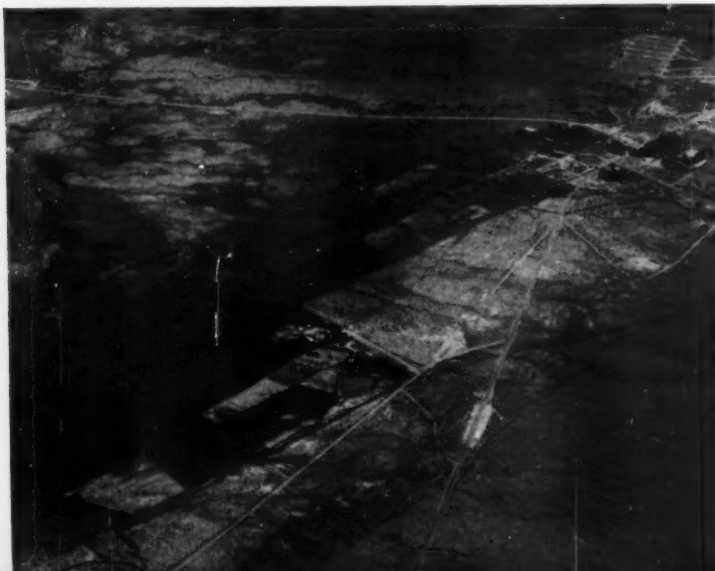


Ranger Archie Murchie and Earl Yersin examine Snake Creek Fish Hatchery, which Yersin manages on the eastern slopes of the Snake Mountains



Sawmill at Garrison, Utah, uses logs cut under permit and bought from Humboldt National Forest on the eastern slopes of Snake Range

Dry desert valley beneath slopes of Snake Range is nurtured by waters of Baker Creek, Lehman Creek, and Garrison Reservoir, fed by a large spring



ready set aside and operating as the Lehman Caves National Monument.

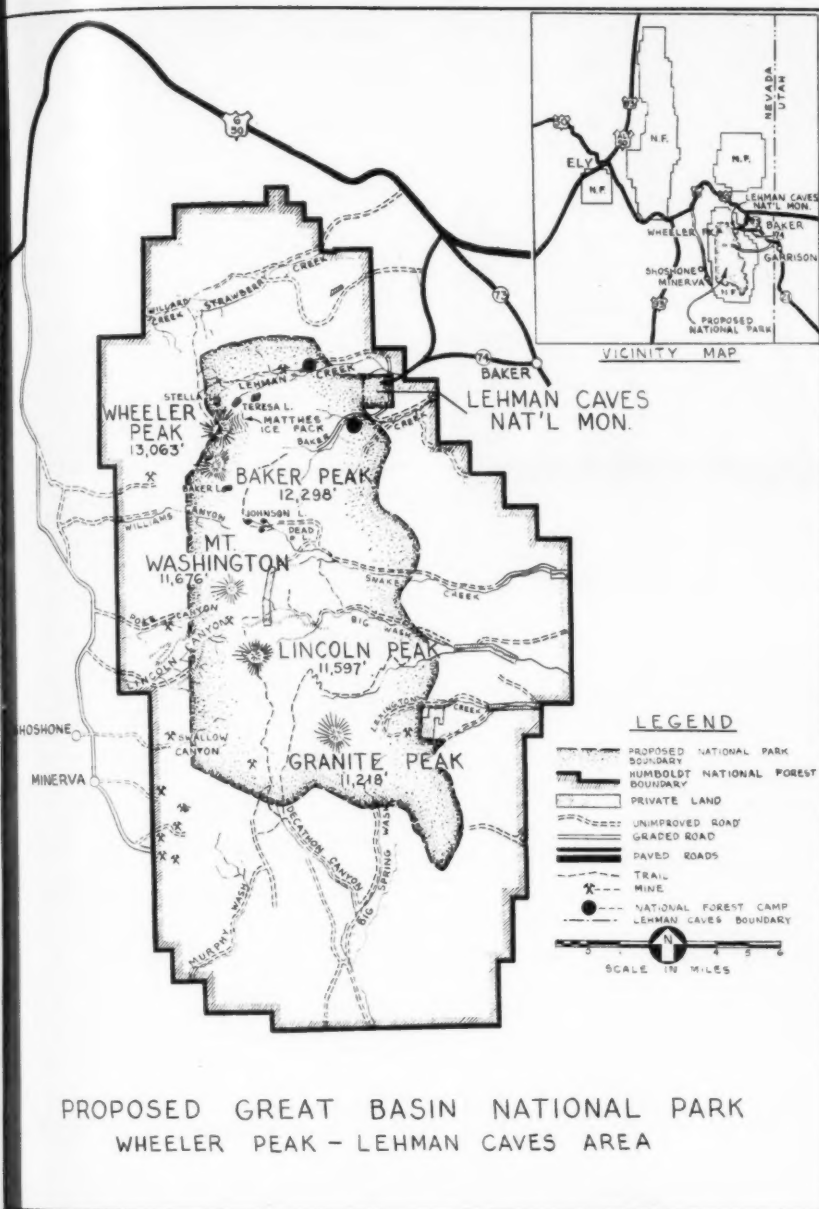
The proposal has recently been expanded to include 220,000 acres of the Snake Range, leaving only 20,000 acres in the southwest corner of the Snake unit in the national forest. An additional 63,000 acres of public domain along the east side have been added to the proposal.

Sixty per cent of the new proposal inside the national forest area is within an established mining district. The area is generally highly mineralized, and contains several patented mining claims and an unknown number of unpatented ones. Several hundred acres of private ranch lands are included in the area outside the national forest. Either proposal, if made into a national park or a national monument, would create an impossible management problem. According to the Nevada Fish and Game Department, 800 sportsmen have been permitted, in past years, to harvest the annual deer crop. This essential management process would be eliminated. The National Park Service would have a "bear by the tail."

Both proposals would seriously affect the operations of ranchers and livestock men in this area. The latter proposal, No. 2, would, of course, most seriously affect them. I am not advocating over-use of forage by livestock, but conservative use — use which will perpetuate the forage supply and protect the soil and watershed. The impact of either proposal would be serious for the colorful and profitable ranching operations in eastern Nevada and western Utah, as well as for the whole economy of Nevada, present and future, although proponents may say that the ranch economy will be replaced by a single recreation economy.

Under multiple use management, with the application of research methods and through the cooperative efforts of the land managing agencies, the Nevada Fish and Game Department, the sportsmen, those interested in recreation development, the water users, the stockmen, and other interested groups, we can have a permanent, productive and thriving economy, without the restrictions necessarily imposed by a national park or national monument status.

Topographically the area is high and mountainous, culminating in Wheeler Peak, rugged and spectacular, rising to 13,063 feet. On the north face of Wheeler Peak is a deep cirque holding a permanent snow field or névé, highly valuable as a



strong, ranges the area for an eight-month period each year. Fishing is kept good by seasonal plantings from the Snake Creek Fish Hatchery, a state-maintained agency. Beaver (restricted to trapping, of course) abound in upper reaches of the streams.

There is an estimated 3,000,000 feet of merchantable timber in the area, about one-half of it being ponderosa pine. In addition, about 1,500 piñon pine Christmas trees are harvested each year on a thinning basis.

The Wheeler Peak areas provide annual grazing for more than 400 cattle and about 4,000 sheep.

The mining resources of the area stand high among the region's assets. More than 260 acres are covered by patented claims, and nearly 1,200 acres more by valid unpatented claims. The western slopes generally are mineralized and mining potential is considered to be good.

Would it be wise for Congress to pass a bill this year—or ever—withdrawing this area from multiple-use privileges? It is my firm belief that it would not.

This belief, if justified, must be supported, of course, by strict reference to the facts. I should like to return therefore to the article by Mr. Heald, already referred to. He says, "... it is one of the fundamental policies of the Park Service that each unit within the system should exemplify a definite type of scenery which is a supreme example of America's originally rich and diversified wilderness." This statement of course is in keeping with national park policy

(Turn to page 40)

Ranger Murchie scales a big ponderosa pine log from North Fork of Big Wash



Earlier proposals than the one indicated on map on page 16, reveal that less national forest land would be taken for the national park

water resource, but technically a névé, rather than a glacier as some enthusiasts have advertised it and supposed it to be.

The resources generally are typical for such a region, and are especially to be prized in a state where high and verdant terrain is extremely limited in proportion to total state area.

Twelve streams have their source in this area, with a peak flow sufficient to irrigate about 10,000 acres of farm and ranch lands. In addition, these streams supply domestic water for four local communities as

well as for the private ranch establishments scattered along stream courses.

Recreational facilities, concentrated largely in the Lower Lehman Creek area, include 45 picnic sites and camping units and 14 trailer-house units. A system of well-kept trails is being projected into outlying wilderness spots, and about 45,000 people are already coming to the area annually and making use of existing facilities.

Wildlife is considered plentiful. A deer herd estimated to be 3,000



Troll fishing in Everglades Park just off the Ten Thousand Islands



Roseate spoonbill and other unusual birds are found on Duck Rock



National Audubon Society sends boat tours through mangrove region, south to Ten Thousand Islands, including Duck Rock



National Park Service's "Southeastern Mounties" patrol park with air boats

New marina at Flamingo on Florida Bay is near southern part of the Everglades



By E. JOHN LONG

WHEN the southern tip of the mainland of the United States was proposed as a national park several decades ago, skeptics wondered what this lonely, half-awash, insect-ridden, end-of-the-world region could possibly have to offer that would justify its inclusion as a part of the great public reserve and recreational system of the federal government.

But most of these doubters were persons who had never visited the Everglades, nor had any true concept of its natural charm and sub-tropical beauty. Some of them dismissed it as "just another swamp." Others protested that only the fringes were accessible, and therefore its usefulness as a resort area would be very limited. Others decried its monotonous flatness, declaring derisively that the only superlative to which it could aspire was "the greatest concentration of saw grass in the world."

These were men of little vision and less understanding concerning one of the few natural wildernesses left in the eastern United States, a vast and necessary breeding and dwelling place for some of the nation's unique flora and fauna, and the winter home of thousands of migrating birds. Fortunately, the jibes and prejudices of the doubters did not prevail. In 1947, Congress set aside some 2,300 square miles of land and water southwest of Miami as the site of the Everglades National Park.

Perhaps because the region was almost entirely uninhabited and much of the actual acreage would have to be acquired by gift and future purchase, the boundaries of the park were not too clearly defined. This, of course, was a mistake. But how were legislators in far-off Washington to know that the pinelands along the eastern fringe of the park would soon become desirable acreage in the

THE RIVER



OF GRASS

eyes of an expanding southern Florida winter-vegetable industry? How could they foresee that mushrooming cities on the east and west coasts of Florida would send realtors into the mangrove swamps of the park's sea fringes, seeking new sites to develop as subdivisions and tourist resorts?

Part of the trouble goes back to 1934, when the original surveys for the park covered some 2,164,000 acres of land, most of it privately owned. Much of the area of the park itself was acquired through gifts of land or donations to buy it. However, until 1958, bitter controversy raged over

not only the exact boundaries of the park, but also such matters as mineral and oil rights, and the temporary retention of park land being used for agricultural purposes.

All these problems were happily settled in mid-1958 when Congress passed, and the President signed, a bill setting up permanent park boundaries encompassing 1,337,000 acres. "The People of the United States Have Won a Great Victory," headlined the *Miami Herald*, one of the newspapers that crusaded for years against any and all commercial encroachments upon the area. The

final acreage includes some 919,000 of land and 418,000 of water, the latter largely tidal.

Thus Everglades not only has the distinction of being the southernmost national park in the continental United States, but also the most "sea-going," including as it does so much of King Neptune's tidal realm with its unusual sub-tropical marine flora and fauna, in addition to the unique bird and animal life of the land areas.

But let us consider the park as a whole. Except around the edges, Everglades National Park is a vast and true wilderness, completely inaccessible by ordinary means of travel. You will find no human habitations, not even Indian, in its watery interior, nor any roads or trails. Launches and small craft penetrate a short distance into the maze of waterways along the coast, but only "swamp buggies" (balloon-tired, high-wheeled vehicles) and air boats can travel very far into its central watery fastnesses.

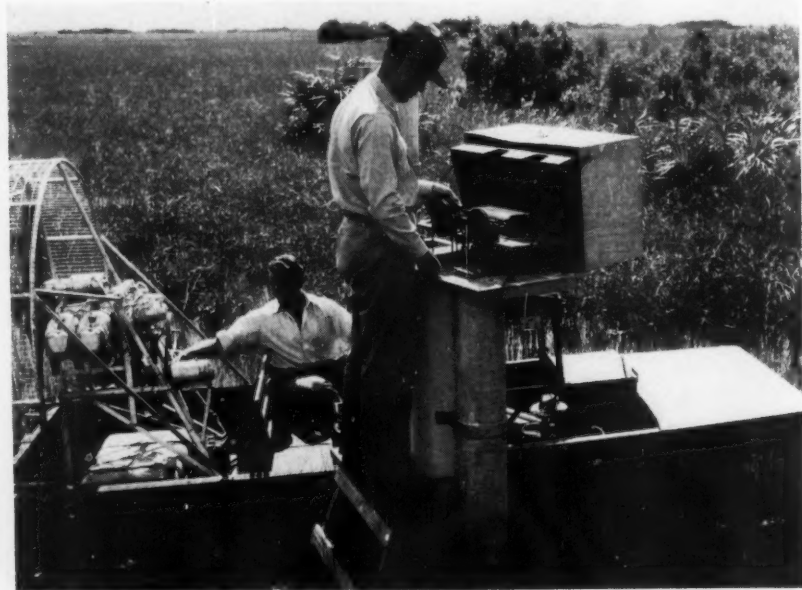
It is a mistake, however, to consider the Everglades a swamp. Stagnant as its waters appear, they are moving slowly, almost imperceptibly, from that great central fount, Lake Okeechobee, south and west to the Gulf of Mexico. The surface water, although shallow, is fresh throughout most of the Everglades, the level rising and falling somewhat with the prevailing rains.

This is not to imply that there are no swamp areas in the Everglades, nor even small lakes surrounded by marshes. After the first false impression of monotony has worn off, you will discover, to your delight and amazement, that the Everglades is a mosaic of many strange and interesting features. Once it was all at the bottom of a shallow sea. Then the sea fell or the land rose—we are not sure which—leaving the Everglades scarcely above the present sea level.

"Pahayokee," the Indians called these timeless stretches of grassland, meaning "grassy waters" or marshes. But the true Everglades are not just grass alone. Clusters or domes of trees, humped like green whales or hangars, make "islands" of solid vegetation in the open fields or among the pines.

These are sometimes called "hammocks," and they look like small low hills when viewed from a distance in the misty morning light. Their true name is "hammock," from *hamaca*, an Arawak word for masses of jungle vegetation floating in a tropical river. However, Florida's hammocks are solidly anchored, being plants, vines,

(Turn to page 50)



National Park Service ranger checks rainfall gauge while on an air boat patrol. Air boats are speedy craft, driven by an airplane motor and propeller

Park Service operates interesting Everglades exhibit at Flamingo—once a ramshackle fishing village, but now a modern resort with motels, shops, etc.



THE SAHARA is the greatest man-made desert. At the time of Mohammed about 1,000,000 Arabs settled in the area which is now the Sahara. They brought with them goats. Every Arab may have had approximately 100 goats. One hundred million goats following in the train of a million nomadic farmers would not allow very much tree growth, hence the beginning of the world's greatest desert, which is spreading faster today than it has ever done in past history, and which is now so big that it would contain the whole of the U.S.A., or all of the land area of Australia, with an ever-increasing perimeter of sandy waste.

When I first went to Africa in 1920, the Sahara was encroaching on the food-bearing lands of Equatorial Africa along a 1000-mile front to a depth of $\frac{3}{4}$ mile a year. The findings of the Sahara University expedition in 1952-1953 were that it was advancing along a 2000-mile front in places up to a depth of 30 miles a year. The speeding up of the process of destruction had been caused by cotton growing. The indigenous people, having had a taste for cash crops, were felling the high forest to grow cotton, leaving a trail of destruction behind them. After having raised one crop they would move deeper into the forest and clear a fresh area each year. Since the tree cover was removed, the water table sank and very soon desert conditions prevailed. The grazing goats and camels would not permit young tree growth in the wake of the nomadic farmers.

The findings of our Sahara expedition have been reinforced by the discovery of a more recent expedition which returned with a rich harvest of rupestrian art and cave and rock drawings. Pictures have been found of water-loving animals such as hippopotamus and elephant. Remains of ancient trees which we discovered in the sandy wastes would indicate that the climate in days gone by was similar to that prevailing in the rain forests farther south. And even today, where there is sufficient rainfall along the southern perimeter of the Sahara, if goats are excluded, trees of the rain forest reappear.

Audley Money-Kyrle, Ray Perry, and I were speeding across the sandy waste of the Sahara driving south from Algiers to Kano on our ecological survey. I was very much occupied with my driving. We had been skating over hard-packed sand at 50

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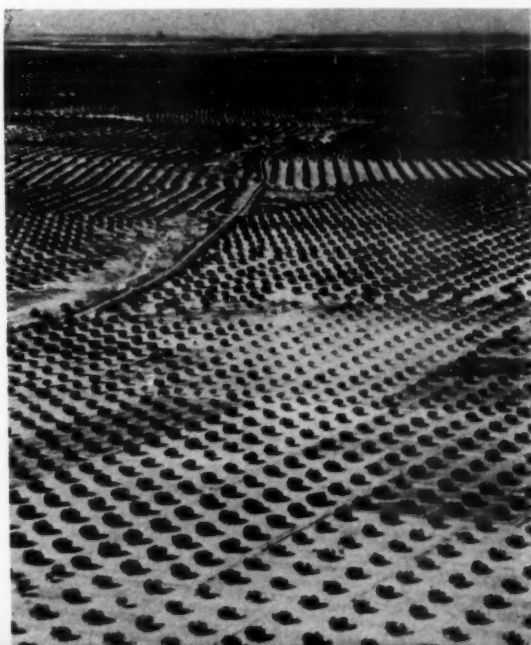
Sahara Challenge

By RICHARD ST. BARBE BAKER



Mr. Baker, founder of England's Men of the Trees, is author of *Green Glades* and *Sahara Challenge*. He was leader of Sahara University Expedition, 1952-53.

Where there was sand, 26 million trees produce annually about 45,000 tons of oil in Tunisian olive grove



Alaska's Mendenhall Glacier in
the Tongass National Forest is
favorite with recreation seekers
during all seasons of the year

Climbers find ice hummock of
glacier exciting place to hike



Deeply-hued ice caves are exposed as
bergs slough off the face of glacier

Eleven miles from Juneau, glacier is
one of few in world accessible by car

Let's go to the





Everyone enjoys a swim at Dredge Lake, so named because it was a hole from which Army dredged sand and gravel for road building

Many people gather clear, glacial ice to sell to restaurants and housewives. They load it on hoist which will dump it into a truck



Alaska sportsmen use Forest Service range parallel to Mendenhall Glacier for target practice

Skating among icebergs on Mendenhall Lake is favorite sport



GLACIER

WHAT are we going to do today?" asked twelve-year-old Roger one Sunday morning as he sopped up the last few drops of syrup with his last bite of sourdough hotcake.

"Let's go to the glacier," suggested his older brother Allen. "I can take my .22 along and hunt rabbits."

"Oh, let's," carolled Sally. "I can go in swimming, can't I, Mama?"

I agreed, thinking of the alpine plants I could gather for my garden while the children were busy.

"Sounds fine to me," seconded my husband. "I've been wanting to sight in my new shotgun."

By LOUISE SHATTUCK

The encyclopedia defines a glacier as a slowly moving river of ice—hardly a place to hunt, swim, gather flowers, and have a family picnic. But our glacier offers much more than this, and is our favorite recreational spot, winter or summer.

The glacier we call ours is Alaska's Mendenhall Glacier, in Tongass National Forest, eleven miles from our home in Juneau. It is one of the few glaciers in the world accessible by automobile.

When the weather is warm enough to melt the face, or snout, of a glacier faster than the snow can pile up in the mountains and force the river of ice forward, it is called a receding glacier. Mendenhall is such a glacier, lying in a sandy valley which it is uncovering as it recedes a few feet each year.

At its face is a lake formed by the melting ice. The water is frigid and studded with icebergs which have sloughed off the face of the glacier. It is at this lake and in this valley, covered with scrub growth and young evergreens, that we find year-around

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Venerable white pines were source of cooperage staves. Old-time coopers built watertight hogsheads for commerce, barrels for shipping produce, buckets for maple sap, wooden pails for use in homes

WOODEN BARRELS

Kingston Cooper Shop was erected in Kingston, N. H. in 1785. Today, it is oldest American workshop in craft section of Greenfield Village. Cooper, in photo, sits on shaving horse to shape barrel staves



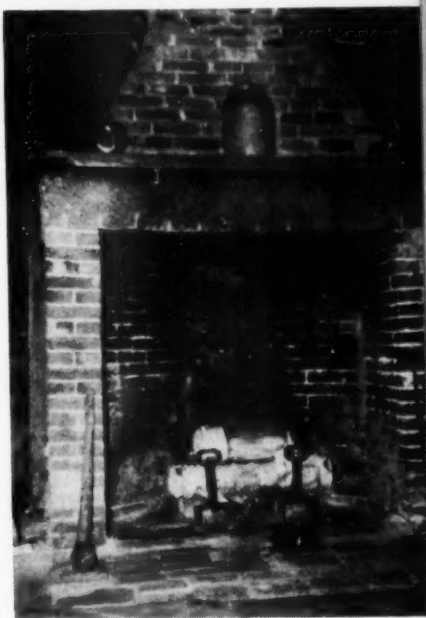


Stacks of seasoned hoop-poles lean against rear workbench of cooper shop. Shaved hoops, right foreground, are ready to be notched, steamed and bent



Cooperage tools were often made in home blacksmith shop. Blacksmith also shod horses and oxen, and repaired felloes (tires) for cart and buggy wheels

Steambox for softening barrel staves to make them pliable was slipped beneath stone slab under plank mantel



from New England Forests

By J. ALMUS RUSSELL

WHITE oak, yellow oak, red oak. Ash, hickory, and elm. Basswood, beech, and pine. Such well-known trees growing in New England forests in grandfather's time provided the staves for wooden barrels. In addition, these trees furnished all of the staves used in the local cooperages for the wooden containers of that day.

For hoops to hold the staves in place, the sprout-lot yielded hickory, ash, and "poverty" birch saplings. For barrelheads, chestnut was preferred.

Suitable logs of these woods were drawn in across the snow on ox-sledges to the waterpower-driven stamemill, to the sawmill with its up-and-down saw, and to the hoop-pole shop. They were then worked up into staves, boards, or hoops as the occasion demanded. After that they were stored and seasoned before being used in cooperage products.

Firkins, barrels, and hogsheads, fashioned by wet, dry, and white

coopers—all of these wooden containers were an important part of the now all-but-forgotten craft of nineteenth century cooperage; for, indeed, cooperage signified not only the hand-facture of barrels and all other hooped products, but the cooper-shop as well.

Barrels of soft wood to hold meals, flours, sugar, and salt were produced by the dry cooper. These casks had board covers for easy removal instead of permanent barrel-heads.

The wet cooper built hardwood barrels for the storage of liquids and liquors. Not only were they made watertight to prevent leakage, but airtight as well to forestall fermentation, moulding, or musting of their contents. Such barrels bulged at the "belly" and narrowed at the ends, with staves projecting above the barrel-heads. These contours protected the barrels from the force of outside blows and heavy handling, and from the inside pressure of gases.

Smaller wooden buckets, tubs, and

piggins; water, powder, and rum kegs; churns, canteens, and switchel jugs—all of these were but a few examples of the white cooper's straight-sided craft.

Wooden barrels stored pantry staples on the self-sufficing farms during the stormy winter months when access to stores was difficult. Kegs, hogsheads, and puncheons were filled with salt pork, corned beef, brined fish, and winter vegetables. Straight-sided churns, sap-buckets, and tubs were in constant demand for holding cream, butter, cheese, and sap.

Standing apart from the other homestead buildings, the cooper shop with its large windows and capacious fireplace was a cheerful rendezvous for worker and visitor alike; for labor, conversation, and checker-playing as well.

At the far end of the shop was a smithy containing an anvil, forge, and bellows for making and repairing the cooperage tools and for shoe-

(Turn to page 55)

How does the U. S. Forest Service meet its responsibility to the taxpayer in protecting 180 million acres of valuable forest land from insects? Here are the answers. The big job consists of these four key steps—prevention, detection, evaluation and suppression

KEEPING FOREST IN

EARLY one June morning, several years ago, I was riding a timber trail with a forest ranger in south-east Idaho, when the sudden appearance of a loud, low-flying airplane startled us and our horses. We halted to watch the plane as it skimmed over a nearby stand of Douglasfir, pouring out a white, smoky-looking carpet behind it. To us this was a welcome sight. We knew what was in the streak of man-made cloud that hovered over the tree tops. It was a combination of DDT and fuel oil destined for a hungry little insect larva—the spruce budworm—which, along with billions of uninvited kinfolk, had chewed the leaves from that same stand of trees the year

before and was now set for a repeat performance.

The previous year, the wasteful sight of thousands of naked treetops had made the ranger unhappy and worried. He knew that a tree without a crown full of green leaves cannot grow much wood. He knew that a defoliated tree is a weak tree, and an open invitation to other insects and diseases to attack it. As a professional forester, he also knew that repeated defoliation is deadly to a tree, and he was well acquainted with the waste in a dead forest—the mass of barren snags, some fallen, some leaning, and some standing. He was well acquainted with the fire hazard it presents, and the serious

aftermath of a fire in an insect-killed timber stand. He had done something about the budworm. He had promptly initiated the long chain of action that culminated with the arrival of the spray plane.

As the aircraft faded out in the distance, the ranger knew that this year and for some years thereafter, the insecticide would hold the spruce budworm in firm check. We turned our horses to continue down the trail. The ranger whistled to himself, contentedly. I felt pretty good myself.

Later that same day, the supervisor of the national forest that was being sprayed received a caller. The visitor, too, had seen the spray plane. He

1 **PREVENTION** The best forest is a healthy forest. To keep it that way good management—good silviculture—is required. To practice good forestry requires manpower and it also requires money. From the taxpayer's standpoint an ounce of prevention is worth a pound of cure, and well worth it



2 **DETECTION** Constant vigilance in detecting epidemics is the watchword. Foresters, towermen and air observers keep a sharp lookout for danger signals. All other forest users—fishermen, hunters, etc., can help too by reporting all abnormalities promptly



By W. S. SWINGLER

Assistant Chief, U. S. Forest Service

INSECTS IN THEIR PLACE

was from a distant city and was staying at a summer home on a nearby forest lake. He had read an article which stated that insect sprays were detrimental to fish and game. He enjoyed fishing and was very much concerned about the effect of the spray on the fish.

The forest supervisor related the great pains that were taken by the U. S. Forest Service to keep the insecticide away from water. He told him about the vast timber, recreation, water, and wildlife values that were at stake and described the care, study, and preparation that preceded the spraying. The summer home owner left much relieved.

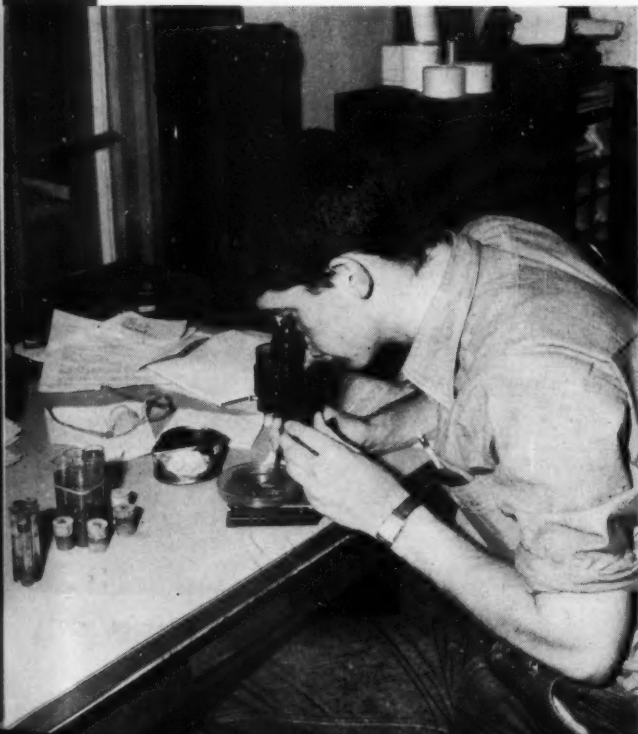
The situation just related is not

at all uncommon. The United States Forest Service, with its responsibility for the protection and management of 180 million acres of immensely valuable national forest lands, and its additional responsibility for other public and private lands, has found itself "in the middle" many times. To stand idly by while an insect which can be controlled decimates a forest resource would be a dereliction of duty. To ignore public opinion is no better. A logical question then is, "How does the United States Forest Service meet its responsibility to the American taxpayer in protecting the nation's forests from insects?" First, let's briefly review the impact of one of the earth's most common

living forms, the insect, on the forest resource.

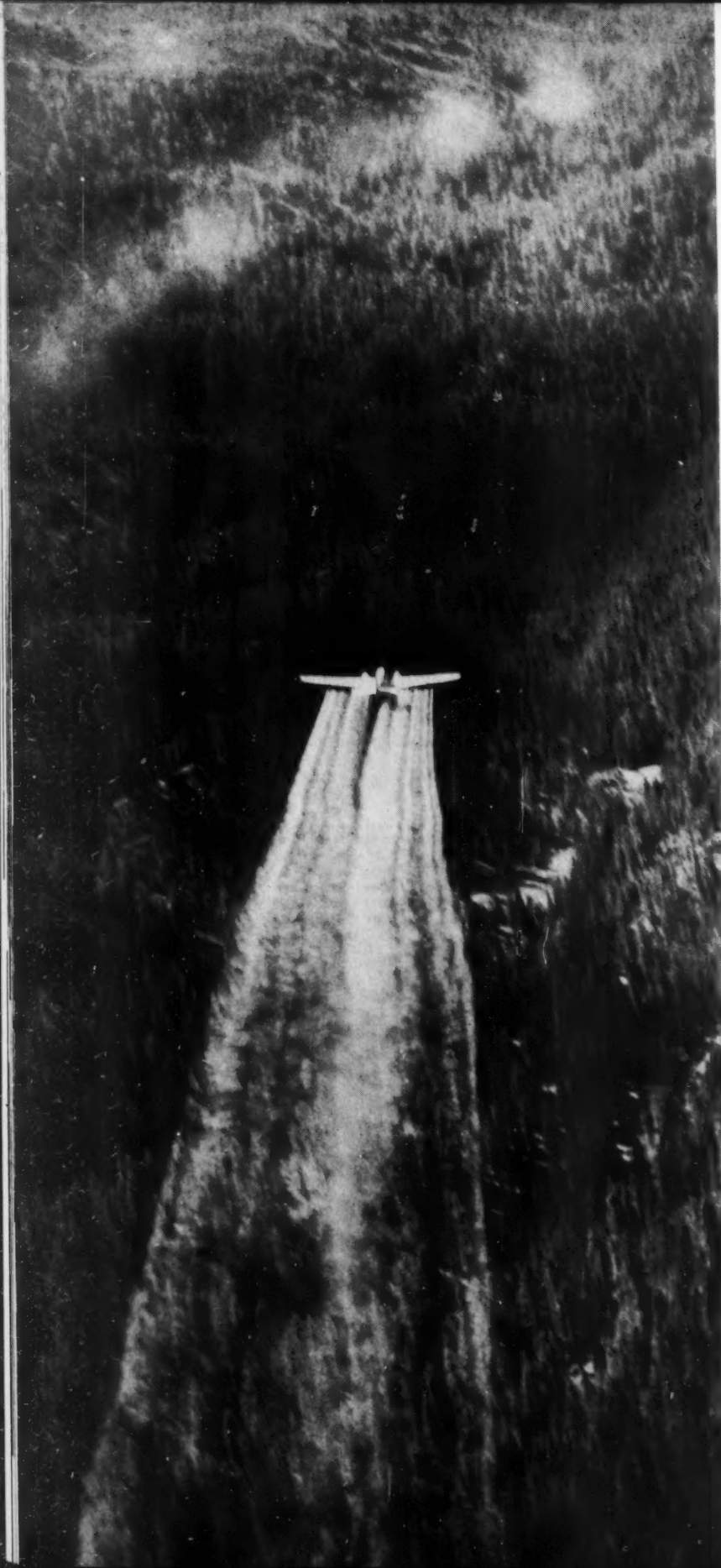
There are some 489 million acres of commercial forest land in the United States, including Alaska. Add to this 175 million acres of non-commercial forest land, much of which is extremely valuable watershed land, and you have 664 million acres on which there are billions and billions of trees of one form or another. These trees fall into 152 commercial species and 892 non-commercial species—a total of 1,044 species of natural or naturalized trees. Then consider this: Every one of those tree species has its own peculiar brand of insect enemies. Some of the less particular insects may attack several spe-

3 EVALUATION Once an abnormal forest insect activity is reported what's done about it? Plenty. One or more of 11 forest experiment stations swing into action. Entomologists make an on-the-ground reconnaissance, carry on their laboratory research work which enables them to make recommendations



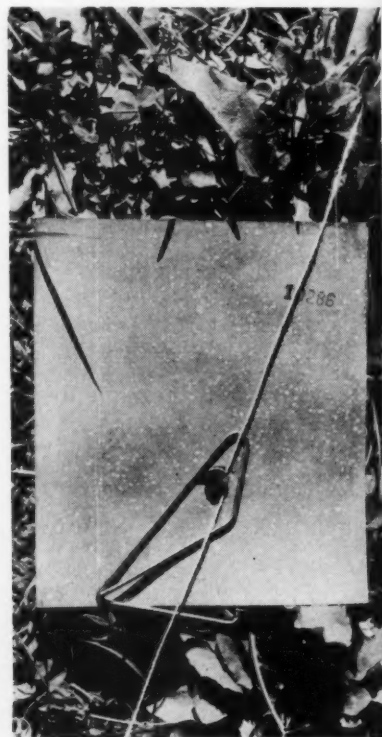
4 SUPPRESSION Once the report is in, do foresters immediately spray? Not at all. To nip the incipient epidemic in the bud, ground controls may be used. In big epidemics, wherever possible, sanitation salvage logging is the best solution





The first responsibility of the public forester is to the American taxpayer. Most of the time, he snuffs out little epidemics before they become big ones. But 180 million acres is a lot of forest and sometimes epidemics get out of control. At such times, forests that required 300 years or more to grow can be wiped out by bark beetles or other insect menaces in a matter of months. To check these onslaughts, the forester may resort to the use of insecticides. While an element of hazard is involved, the forester moves into this field with his eyes wide open. He believes these hazards are slight when stacked up against the needs of more and more people who continue to demand more and more wood. The photo by W. E. Steuerwald on the left shows how foresters brought a spruce budworm epidemic under control on the Payette National Forest in the state of Idaho

Spray work is no hit or miss proposition. Preparations require many weeks. Spray cards (below) placed four chains apart in spray blocks enable forester to check amount of spray falling in areas





When danger threatens the forest, professionals can move very quickly. Paul Bieler took this picture of the Red Creek Insect Control Camp set up on Teton Forest, Wyoming

cies of trees. Add to this the fact that every once in a while, despite all efforts to bar him from our borders, a new forest insect gets a foothold in our woodlands, and you have some idea of the massive array of insect enemies with which our foresters must cope.

Insects attack trees in different ways and during all stages of their growth. Many forest bugs are specialists. Some work above the ground, some below. Each has its favorite part of a tree. Some feed on the leaves of the tree, some on the wood, some on its flowers, some on its seeds, some on its buds, some on its growing layer (the cambium), and some on the roots. No part of a tree can be said to be immune to insect attack. And although a tree is particularly vulnerable in its earliest and its most mature years, at no stage in its life can it be said to be completely safe from insect attack. The insect threat, to some degree, lurks in the forest always.

The white grub, an underground operator, specializes in attacking trees in their infant stage by cutting off their roots. It can raise havoc with whole nursery beds of tree seedlings or with newly established plantations. There is hardly a tree nurseryman in the United States who hasn't had to face the white grub menace at one time or another.

Larvae of the cambium eaters—the bark beetles—feed on the growing tissues of the tree found beneath the bark. They bore tunnels and galleries in the cambium layer between the bark and the wood until the tree is girdled and dies, as completely as if it were done with an axe. A member of this clan, the Engelmann spruce beetle, has devastated many miles of forest land in Colorado and Montana, ruining billions of board feet of timber. In the East another bark beetle, the southern pine beetle, will take on just about any species of pine he

Unit Base Supervisor Ike Mills, Observer Pilot Jim McClure and Observer Bob Donnelley check a spray block on the Cascade unit of a spruce budworm control project



finds from Pennsylvania south to the Gulf of Mexico and west to the Ozarks. And for a time last year down in east Texas, a tiny bark beetle, the Ips engraver, was turning a million board feet of southern yellow pine timber into dead trees every month.

The defoliators, as an insect group, rank close to that number one destroyer, the bark beetle. They include such destructive insects as the tussock moth, hemlock looper, larch sawfly, spruce budworm, and pine butterfly. In 1957, the impact of the spruce budworm on Montana's spruce and fir Christmas tree industry alone represented an economic loss of \$450,000 to that state. In ten years, the hemlock looper killed 300 million board feet of hemlock. It took the tussock moth fifteen years to kill the same volume of Douglas-fir.

The same spruce budworm which has ravaged the spruce and fir forest stands of the West is equally at home in the East. In an epidemic that lasted from 1910 to 1920, it hit the spruce and fir forests of northern

New England, eastern Canada, and Minnesota, and didn't stop until it had destroyed a twenty-five-year supply of pulpwood. For the past several years, Canadian and U. S. foresters have been battling to contain epidemic outbreaks of this insect in Maine and Canada.

The many kinds of bugs that attack forest trees include aphids and scales that suck the juices from foliage, twigs, or trunk, weakening the trees, slowing their growth, and often killing them. The balsam woolly aphid, a European insect immigrant, entered the North American continent sometime around 1900 on planting stock imported to Nova Scotia. By 1908, it was in Maine, and later spread through the New England States, New York, and some of the southern states. In 1954, this aphid was first detected in the Pacific Northwest. Since that time it has spread over nearly 600,000 acres of federal, private and state forest lands, and is now rated as the Pacific Northwest's forest insect enemy number one. A recent survey of the heavily infested Mt. St. Helens area in Wash-

Typical stand of Douglasfir on Helena National Forest during an invasion of spruce budworms. Tree tops are losing the foliage and starting to turn brown



Even mules are pressed into service to combat an insect attack. Here packers load 5-gallon cans, filled with spray materials, for use in the infested areas

ington revealed that more than three billion board feet of true firs, or better than one-half the total volume, has already been badly damaged or killed by the balsam woolly aphid. The insect is no respecter of boundary lines. The Weyerhaeuser Timber Company and the Gifford Pinchot National Forest are the principal losers to date in this latest venture of the balsam woolly aphid. Thus far, this insect pest has eluded man's effort to control it. More intensive research is urgently needed to devise effective methods of control.

Other insects lay eggs in the flowers, fruit, or seeds of trees. When the larvae hatch, the damage caused by their feeding may prevent the tree from producing seed to perpetuate itself. Certain flies, moths, beetles, and wasps cause the growth of galls when they deposit their eggs in the living tissues of the stems, leaves, or fruit of trees.

Wood is the favorite diet of the wood borers. They pass through the bark and cambium and into the wood, causing injuries to living trees which show up as defects in the lumber, thus reducing value. Some wood borers transmit tree-killing diseases. A tiny member of this insect brotherhood, the California flatheaded borer, is now in an epidemic status in the pine stands of southern California. It is causing extensive losses to valuable Jeffrey pine timber on the Los Padres and Cleveland National Forests as well as on intermingled private timberland.

Wood borers also cause great damage to stored logs and felled timber that is left lying in the woods during their period of activity. The thousands of holes they drill in trees provide an avenue of entry for all kinds of wood-degrading fungi, rots, and stains.

It makes no difference what forest-destroying techniques insects may follow, the net result is the same—a tremendous economic and aesthetic loss to the people of America.

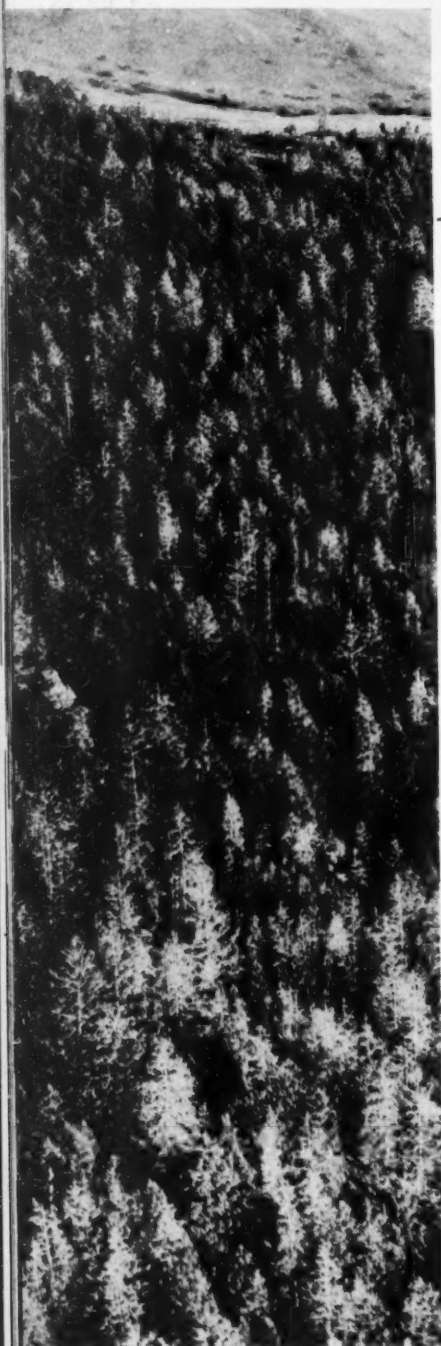
You can get some idea of the loss from the fact that forest insects each year kill one billion cubic feet of growing stock—the younger trees—and five billion board feet of sawtimber, the older, more mature trees.

Add to this an average annual loss in growth of 1.8 billion cubic feet in the growing stock and 8.6 billion board feet in sawtimber and you begin to get into facts and figures that are awesome.

Saying it still another way, the annual insect loss in sawtimber alone is 13.6 billion board feet per year—enough to build $1\frac{1}{3}$ million homes, or just about enough new homes to house all of New York City's people!

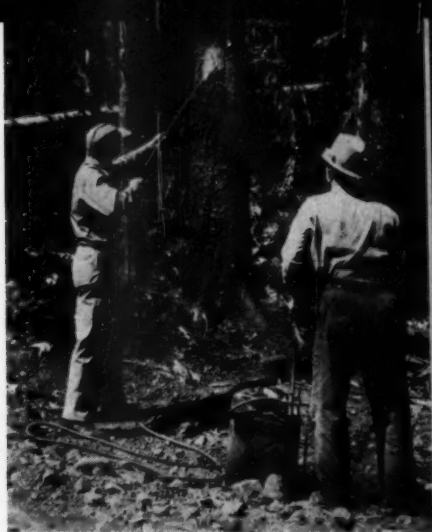
There is no question about it; when it comes to forest bugs, you are dealing with a woodland destroyer responsible for another one of those proverbial holes through which a very vital part of America's sustenance is constantly slipping away.

While losses in wood are impressive, they are only a part of the forest insect story. Anyone who has





Three-man spray team works in steep terrain in the Elliot Creek Camp area of Arapaho Nat'l Forest. Horse packing of "goop" filled can used wherever possible



John Burke (left) and Virgil Stevens developed a time-saving spraying aid

driven through Montana, Idaho, Wyoming, or Colorado and has seen hundreds of acres of dense stands of once-green lodgepole pine turned bronze where the pine beetle sapped the life out of the tree can understand the vicious punch this little insect wields. Anyone who has clambered under and over acres and acres of fallen, thickly-interlaced, insect-killed trees has probably been appalled at the waste. And anyone who has had to fight a fire in an insect-killed timber stand will never forget the fury, speed, and thoroughness with which all trees, living and dead, wildlife, and fertile, water-protecting topsoil are destroyed.

Any way you look at it, the forest insect is a serious threat to be reckoned with. It can cripple trees, it can

kill trees, it can stunt growth. Sometimes in a few months it can snuff the life out of a forest that has taken perhaps three hundred years to grow; and with its aftermath of fire, it can destroy soil that was a thousand years in the making. It can help trigger floods, it can help destroy wildlife and make the habitat untenable to certain wildlife for years. It can help pollute the streams and lakes with silt and ash, much to the detriment of the fish life therein. With our population skyrocketing and with an ever-growing demand from the people for more outdoor recreation, more timber, more water, and more wildlife, we cannot afford the wastefulness of insect epidemics.

The question is, "What are we doing about it?"

The answer is, "We are doing a lot more than we have ever done before, but nowhere near enough to get on top of the forest insect problem."

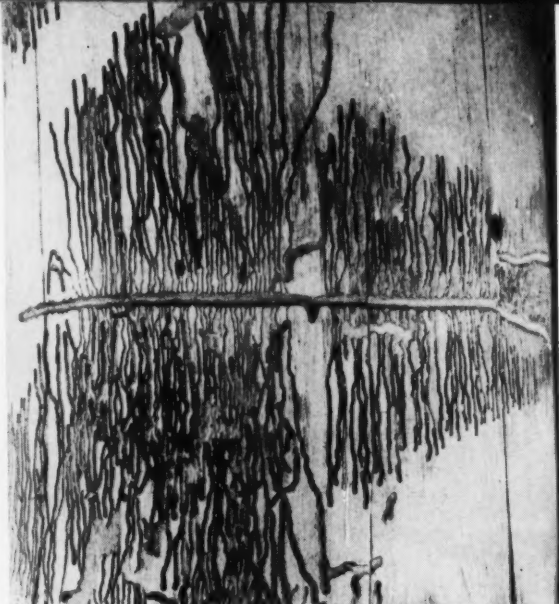
Until the beginning of the twentieth century, little attention was given to forest insects—to the damage they were doing or to their habits and control methods. About that time, the Black Hills beetle struck the ponderosa pine in the Black Hills of South Dakota, on a rampage that lasted until 1908, killing practically all the mature pine on more than 100,000 acres. The devastation shocked both professional foresters and the public into action. It catalyzed an interest in forest insects that has been growing ever since. An increasing number of forest entomol-

An adult pine reproduction weevil as it is feeding on a ponderosa pine needle



Grubs of the flatheaded borer, enlarged two diameters, belong to group of insects that injure living trees and transmit some tree-killing diseases





A fir engraver egg gallery and larval mines on the sapwood surface only thirty-five days after attack



Birds have torn off bark of this bark beetle infested Engelmann spruce to reach the larvae under bark

ogists were graduated from colleges and universities. More and more forest managers, public and private, were trained to look for and be aware of damaging forest insects.

As our knowledge of forest insects advanced, and as we gained more and more experience in their control, our procedure fell into a pattern of operation which has proven to be particularly successful. In general, protection against forest insects involves four major activities—prevention, detection, evaluation, and suppression. I would like to describe them:

Prevention

Foresters are sold on forest fire prevention. They know that every fire prevented is one less fire to fight. The same applies to forest insects.

It is better to do everything possible to prevent a forest insect epidemic than to tolerate a threatening infestation until it builds up into epidemic proportions.

As with people, a robust, healthy tree is best able to throw off ailments that affect it. A drought or fire-weakened timber stand, or a crowded, stagnated forest is an open invitation to some of its insect enemies. When it comes to taking care of itself against insects, the strong, fast-growing tree is usually best qualified.

In employing silviculture to discourage insects, the forester can do several things. He can prevent mechanical damage to trees around sawmills, log landings, and roads. He can cut and remove damaged trees which he deems vulnerable to insect

and disease attack as a result of logging. He can practice selective removal of susceptible, low-vigor trees, particularly around recreational areas. He can time his logging to hold slash-infesting insects to a minimum. One common source of bark beetle epidemics is the population that develops in damaged timber such as windfalls, fire-scorched trees, and flood and ice-damaged trees. If accessible, such timber could be salvaged promptly, and the necessary direct control measures applied.

Felled trees and logs are attractive to some species of destructive insects. Insects developing in down material frequently attack and kill nearby crop and seed trees. This loss can be minimized by avoiding log storage in the woods, by spraying the logs, or by spraying the nearby standing trees.

Dense stands of timber often stagnate in growth and become weakened. Properly-timed thinnings can rejuvenate and strengthen the trees. All these measures and many others are commonly employed by forest managers to hold bark beetles and wood borers in check and to prevent insect outbreaks.

Detection

Foresters prefer not to have forest fires. But if they must come, they know that the cheapest fire is the small fire. To accomplish this, the fire must be detected at the earliest moment, and it must be hit by fire

Crew peels and sprays pine stumps for control of black turpentine beetle. Infected stands are cut, leaving seed trees only. Stumps are sprayed to kill pupating beetles





Sapwood surface near top of white fir after attack by the *Scolytus praeceps*

Bulldozer cuts through rugged terrain making access road into an infested area of Arapaho National Forest. Access roads are needed to control insects as well as fire



fighters soon thereafter. The same line of thinking generally applies to forest insect control.

Our national forest rangers, state and private foresters, and their workers are encouraged to be constantly on the alert for unusual signs of insect activity. Hundreds of forest fire lookouts throughout the nation, with their vast view of millions of acres of woodlands, can be alerted to watch for the potential insect menace. Foresters flying in fire detection aircraft can keep an eye out for forest insect signs. All other forest workers and users—fish and game personnel, local forest residents, packers, hunters, fishermen—can do their part in helping to detect insect activity. They can report suspicious signs promptly to the nearest forest officer's headquarters. Early detection of insect activity is of utmost importance to its control, and no bit of information about it should be taken lightly. Forest managers welcome the cooperation of every forest user and every forest worker, wherever or whomever he may be, in reporting observations of insect activity.

Evaluation

A logical question at this point is, "Once an abnormal forest insect activity has been discovered and reported to the local forest officer, what's done about it?"

The report is transmitted to the nearest United States Forest Service

Experiment Station, of which there are eleven. Here, all available information about the threat is reviewed by forest entomologists. If judged to be sufficiently serious, an on-the-ground investigation is made and opinion is rendered as to whether or not a biological and resource evaluation should be undertaken.

Forest Service insect experts, often working hand in hand with university, privately-employed, and state forest entomologists, estimate what will happen if the infestation is allowed to run its course. They decide whether its trend is upward, downward, or static. They estimate how far it will spread, whether it will kill or maim timber, and the volume of timber it is likely to kill or damage.

They consider possible methods of controlling epidemics. If the timber is accessible to logging roads, perhaps it can be sold, and logging

will get the infested trees out fast enough to prevent further spread. Forest insect experts check the abundance of parasites, predators, and diseases that kill selected insects, because they know that native insects are held in check most of the time by these natural enemies. If these natural insect foes are present in sufficient quantity to do the job, the foresters may decide to take a calculated risk and let nature do its own job of control. If it is an insect introduced from abroad, this may not be possible, because its enemies are usually thousands of miles away in its old home. In such cases, direct action is usually necessary.

However, after evaluating all factors, if the values threatened sufficiently outweigh the cost of control, and if sanitary salvage logging, silvicultural and biological controls are ruled out, then chemical control is

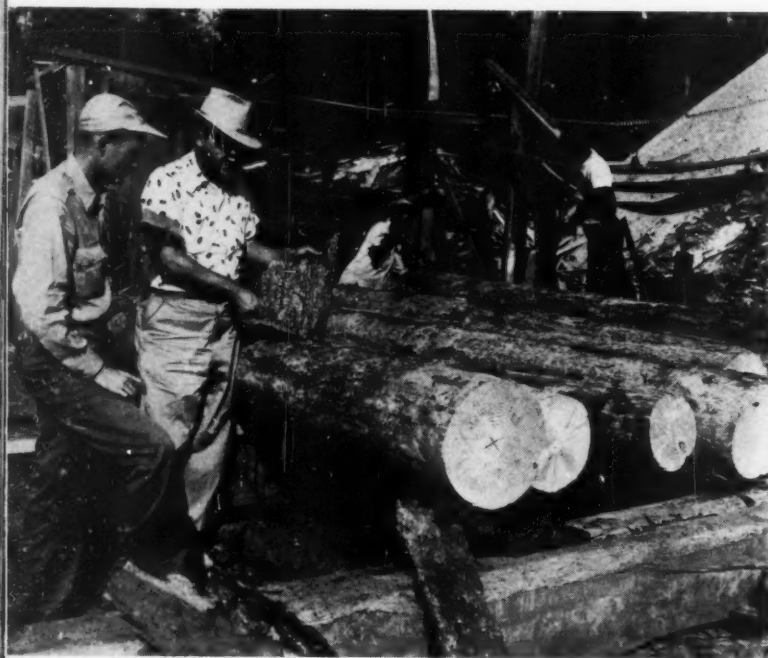
used. It is only employed where other methods cannot do the job in time to avert serious damage to the forest. In controlling pests such as defoliating insects, the forester often has no other choice—either he resorts to an aerial application of insecticides or he loses a forest.

Suppression

Let's assume that the appropriate United States Forest Experiment Station, along with the help of cooperating forest entomologists and forest administrators, has made the biolog-

ical and resource evaluation and the suppression cost estimate, and has evaluated other pertinent factors. Let's also assume that there is need for chemical control of the insect infestation. What happens from here on?

Foresters accept the fact that we will always have insects in the woods. This is so because of the impracticability and the excessive cost of eradicating native pests. The objective of insect suppression, therefore, is to reduce to tolerable levels the losses caused by forest insects.



Ranger Alvis Owen and a mill operator examine logs salvaged from beetle-killed pine stands, Homochitto Nat'l Forest

Ground control methods include spraying with benzene hexachloride mixture which penetrates inner bark recesses



Insects attack trees in different ways and during all stages of their growth

There are two ways to fight forest insects with chemicals. One is from the air with pesticide spraying, and the other is from the ground by manual or mechanical application of the chemical to the individual tree. Generally speaking, aerial sprays are used on defoliating insects and ground-applied chemicals are used on bark beetles.

Prior to application of any pesticide by the United States Forest Service its toxic effects are determined, and where required by state and local laws or regulations, necessary legal or other clearance is obtained. In addition, suppression measures involving use of pesticides are reviewed in advance with federal and state wildlife management agencies.

Where there is a choice between several effective insecticides, the one least toxic to life other than insects is used. The minimum amount and lowest concentration effective on the particular insect being controlled is used.

Ground Control: Not too many years ago, almost the only method for controlling bark beetles was to fell every infested tree, strip the bark from it, and burn the bark. Now beetle infestations can be controlled in most stands by spraying the tree trunks with an insecticide. Benzene hexachloride, mixed with fuel oil or ethylene dibromide dissolved in

water can be used. The insecticide penetrates the bark to inner recesses where the beetle larvae are feeding and kills the larvae.

The size and scope of a ground suppression project may range from a few trees or acres to many thousands. Likewise, the organization required may range from a few men to several hundred, depending upon the project and the limitations of the period during which the insect is most vulnerable. It is well to remember that this period of vulnerability may not be more than a few days. Control men must move fast!

In the preliminary phase of a ground control project, the number of trees to be treated is estimated, area land ownership is determined, type of treatment decided, organization charts prepared, and duties and responsibilities assigned. Suppression and performance standards are developed.

The operational phase is the action phase. On a large control project it is almost like a military operation. Camps, necessary roads, and pesticide mixing plants are constructed out in the forest. Men, equipment, and supplies are assembled. Spotting, treating, and facilitating crews are organized, trained, and assigned. Transportation and communications systems are activated and maintained. Pesticide mixing plants are put in operation and a system of performance checks

maintained to assure efficient and safe spotting and treating techniques. Provisions are made for equipment repair and maintenance and for a steady flow of pesticide to treating crews. Records are kept for efficient administration, for progress and summary reports, and for subsequent resource management decisions.

The urgency of time is prevalent throughout the entire operation. The insect must be caught in its feeding or larva stage. A post-operational phase includes surveys to determine the degree of suppression accomplished. All through the operation, there is close liaison between the forest entomologists, the project administrators, and cooperating state and federal agencies, such as the local state and game department, the U. S. Fish and Wildlife Service, and others. It is a team job.

Aerial Spraying: Aerial spraying with insecticides is probably the most controversial phase of forest insect control work. More has been written and said, pro and con, about spraying and about its effect on plants, animals, fish, and man than on any other phase. In recent years the subject has received increasing attention from conservation-minded individuals and organizations.

We believe that this interest has been beneficial to forest conservation. It has helped focus attention on the destructiveness of forest in-

Crew convoy is dispersed to an infestation area. Note the size of crew and amount of equipment used on one Ranger District alone. A large control project is similar to a military operation



sects and has helped stimulate the highest standard of performance on insect spraying projects. We welcome the continued interest of forest conservationists in aerial insect spraying and are glad to have their many suggestions. Because of this interest I would like to relate in detail the procedure followed by the United States Forest Service in aerial spraying.

We approach aerial spraying with our eyes wide open. It is a complex, hazardous undertaking that requires and receives painstaking preparation to insure safe, effective execution. And here is a fact not generally known: The preliminary phase of an aerial spraying operation may require *months*, whereas the operational phase may take only a *few days*.

During the preliminary phase, organization charts are prepared, duties and responsibilities assigned, and necessary training completed. Density of pre-spray insect populations are estimated in conjunction with larval development checks. Acreages

needing treatment are determined and boundaries established. Contracts for aircraft and pesticides are let. Equipment and supplies are obtained and arrangements are made for housing, feeding, and transporting personnel. An effective communication system is planned and a rigid safety prescription developed for the operational phase. Contacts are made with landowners, necessary rights-of-way are obtained, airfields are constructed or leased. Advance public notices about the project are sent to all affected groups. Working relations are established with the Weather Bureau, Civil Aeronautics Administration, United States Fish and Wildlife Service, state fish and game department, and other federal and state agencies. Suppression and performance standards are developed and precautions outlined for minimizing the hazards of insecticidal spraying to fish and wildlife. These and many other jobs comprise the all-important preparatory phase.

World War II gave us both DDT, the effective insecticide, and aircraft

spraying experience. In the United States Forest Service we started using DDT only after it had been thoroughly tested. It is particularly useful against the defoliators — insects which eat the needles of evergreens or the leaves of broad-leaved trees.

Research men found that a pound of DDT mixed with one gallon of fuel oil and sprayed at the rate of one gallon to the acre was sufficient to kill insects without appreciable harm to forest birds and animals. Where spray has fallen directly on the water, some fish fatalities have been found. However, careful application of the spray, by not spraying near streams and lakes, can accomplish an effective control job with little effect upon fish life.

Armed with DDT, foresters of large timber industries, the states, and the Forest Service have worked cooperatively to bring under control the tussock moth in Idaho which in 1947 infested half a million acres of Douglasfir. No additional spraying on this area has been necessary for nine years.

In addition, the Forest Service has cooperatively sprayed 8.5 million acres of spruce budworm-infested trees in Washington, Oregon, Idaho, Montana, New Mexico, Arizona, Wyoming, Wisconsin, Minnesota, and Michigan during the past decade. Aerial spraying with DDT has brought under control epidemics of the pine butterfly, tent caterpillar, spittlebug, sawfly, and other leaf-eating forest insects on another million acres of valuable tree land.

Pilots spray only when the air is calm, usually from 4:00 to 10:00 A.M., so there will be little drift of chemicals to a non-forest area. They shut off the spray when over crop lands. They turn it off when flying over water. They plan the spray so that it will not drift over water. They don't turn around over water.

The planes are calibrated to deliver the right amount of spray and are checked frequently to assure that the application rate is correct. The pesticide is analyzed periodically to see that the formula remains the same. Pilots space their spray runs to avoid overlaps of the chemical when it lands on the treatment area.

Airplanes are kept in good mechanical condition so sprays will not have to be dumped as an emergency measure. Forest Service chartered observer planes and personnel are on constant duty during spray operations to see that the pesticide is being correctly applied to the designated areas and that all prescribed safe-

(Turn to page 42)



(L.) James L. Madden, Scott Paper Co., Gov. Muskie, Park Director Stuart

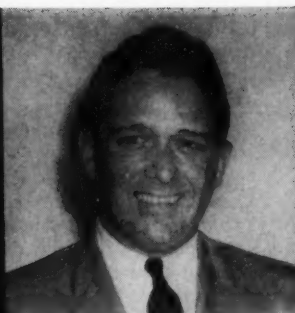
Scott Paper Donates Park Site

A deed transfer from the Scott Paper Company to Maine's Park Commission last month assured a new park in the Lily Bay section of Moosehead Lake. Scott originally offered the state some 300 acres of land at Moosehead Lake, and later increased this offer to 576 acres. Maine Park Director Lawrence Stuart said that the area includes about four miles of shoreline and offshore islands. In making the original offer, Scott vice president James L. Madden said his company recognizes that multiple use, including recreational, is in the best interests of the public.

The outright gift follows a program by the company of previously making available lake shore and other campsites at very nominal rentals for private sites, sporting camps, fish rearing stations and commercial recreational facilities. Among the latter is booming Sugarloaf Mt. Ski Area, sold to the operators on generous terms.

Reading
about

RESOURCES



By MONROE BUSH

NAVIGATION WITHOUT INSTRUMENTS

HAROLD GATTY was one of the genuine personalities of our time. As a young adventurer he circled the globe with Wiley Post in the famous "Winnie Mae." At the time of his death in his middle years he was a Fiji Island planter. Here was a free soul who possessed enough courage to do what he wanted to do, and enough character to do it well.

Gatty lived and breathed the science of navigation, pioneering in many of the procedures upon which air traffic rests today. Increasingly, however, as the full years passed, he studied the timeless arts of "natural navigation," searching for those secrets that travelers used to keep on course before the radio beam, before even the compass. He believed that the rediscovery of natural navigation would be an invaluable supplement to the cold precision of electronic gear, and his posthumously published volume, *Nature Is Your Guide* (E. P. Dutton & Co., New York, 1958. 287 pp. \$4.95) is proof of it.

The most extraordinary books are often those that culminate a life of brilliant, exploratory study. *Nature Is Your Guide* is in this tradition. It is endlessly fascinating. Moreover, it is a major contribution to this Age of Travel. Human beings have a durable capacity for getting lost, be they Antarctic explorers or Saturday fishermen. Gatty is literally a voice crying in the wilderness of strange country, showing us the way back—or more exactly, showing us how we can use our natural senses to find our own way out of almost anywhere.

His chapters range the terrain of earth from snow barrens to desert waste. He takes cognizance of just about every wild environment into which wandering mortals could stray. He observes what there is to learn of direction from waves and birds, from

trees and stars. There is something here for even those who never travel beyond their city's limits, for one chapter offers help in "Finding Your Way in Towns."

For most of us, getting lost is only an inconvenience, and few who buy and read this Gatty book will ever find their lives at stake, with supplies exhausted and a blizzard closing in. Yet *Nature Is Your Guide* is crammed with a wealth of material that can open our eyes to what we see. This book is a veritable alarm clock, awakening its readers to the sights and sounds and smells around them. Valuable as it is for professional navigators, it is equally so for the jaded senses of those of us who can get lost in a plowed field. Harold Gatty has written, for generations of readers to come, what is beyond question one of the freshest, most unique, most directly helpful books ever reviewed in this column.

Fossil Guide

Twelve dollars and fifty cents is a steep price for one book, but when you have looked into *The Fossil Book* by Carroll and Mildred Fenton (Doubleday & Co., Garden City, N. Y., 1958. 482 pp. \$12.50) you will understand the high price, and why it is worth every penny of it.

Here is a profusely illustrated volume, handsomely bound and printed, that is a big book in every respect—big in size and big in conception. The subtitle, "A Record of Prehistoric Life," is more precise than the title itself. The authors plunged into a grand sweep through the evidences of evolution. A lucid, accurate text gives the reader far more than a mere introduction to the incredible development of the biota in the long, long journey out of slime to the present stature of

man. Indeed, it tells all the non-professional need ever know of the subject. While the book is too large to serve as a field guide, there are more than enough excellent illustrations to give an adequately exact definition of whatever specimen you bring home from your diggings.

The book is not for dip-and-run readers. A study of the development of life in terms of fossil remains is not ordinary bedtime reading. The sentences are heavy with substance. Yet it is difficult to conceive of a more useful book for the tens of thousands of laymen who enjoy a deep and informed interest in natural history.

I know of no other single volume that offers the discoveries you will make as you read *The Fossil Book*. Anyone taking the time to study it will learn a completely fresh respect for the incomparable spectacle of the emergence of life as we find it on the planet today. Here is the tale of what has gone before. It is timeless and exciting.

NEW AND TO NOTE

This reviewer is congenitally opposed to anthologies. They have always seemed to me like the stew one has the day after a party. Mixing up the odds and ends from the refrigerator is not good cooking, and only rarely is it good publishing.

From time to time, however, we have noted striking exceptions to this. Anthologies do appear which, while still stew, are very tasty stew indeed. Such a book is *Perspectives on Conservation*, edited for Resources for the Future, Inc., by Henry Jarrett (Johns Hopkins University Press, Baltimore, 1958. 260 pp. \$5.00).

(Turn to page 60)

Mt. Wheeler

(From page 19)

"to protect and preserve areas of remarkable scenic and scientific values." A bit later in the Heald article, however, the author contradicts the idea that the Wheeler Peak area is unique (and therefore that it needs special safeguarding) by pointing out that it is "... typical of the vast desert region between the Rockies and the California Sierra Nevada. . ."

In this last statement, Mr. Heald and those who are thinking with him in terms of national park areas are entirely correct. The Wheeler Peak area is typical, and typical not merely for its locale, but typical of a great many high mountain areas in the Great Basin region. Such areas are spectacular, but scarcely unique; and any justification for withdrawing the Wheeler Peak area from multiple use by making a national park of it would be justification for doing the same thing with any of a score of similar areas.

The name "national park" may sound inviting to many people. It may tend to flatter the people of any state by suggesting that they possess an area unusual enough to deserve setting aside exclusively to provide recreational and scenic values. There is the special danger, too, that people in communities adjacent to the park, or en route to it, may be caught up by unwarranted enthusiasm and proclaim the merits of park status too soon and too loudly, without enough thought.

Let us take the resources offered by the Mt. Wheeler Peak area and consider precisely what would happen to each if the bill in question became law.

I have already made the point that the area, though rather spectacular, is no more unique than many other areas in the Great Basin region. But before leaving this point, I want to add that the preservation of the "scenic values" of this area (one of the main reasons for proposing to turn it into a national park) has not suffered under Forest Service administration, and is in no danger of suffering. They are there, rugged and grand, and protected in a degree quite as rigid as they would be under park status.

I should add also that the proposed national park boundaries would leave a narrow marginal area of forest and range lands in the Snake Range still under Forest Serv-

ice management, but awkward and expensive to administer effectively.

I should like to re-emphasize the point that the particular spot in the Mt. Wheeler area that should be devoted to special use, namely, the Lehman Caves, has already been set aside and is operating as a national monument.

The facts already stated give evidence that the scenic and recreational resources of the region are already being well developed and properly utilized. The facts correctly suggest, too, that the services necessary to a fuller utilization of these resources will be expanded as needed, in keeping with long-established Forest Service policy. The facts should imply also that the scenic and recreational resources of this area, such as they are, can in no way be enhanced nor extended by mere application of a "national park" label.

My whole argument up to this point amounts to this: *The special resources which the national park system is designed most expressly to protect, make available, and preserve, are already being made available, protected and conserved.*

On the one hand, therefore, little if anything that the public needs and wants from the Mt. Wheeler area would be gained by making it into a national park; on the other hand, much—very much—would be lost. Let us see why.

Timber harvesting is an entirely legitimate use, and a critically needed one, in this area. A timber harvest can be perpetuated endlessly under conservative forestry practice without in any way diminishing the scenic and recreational values of the area. Under National Park Service policy, timber usage for merchantable purposes, regardless of potential, is of necessity ruled out.

Grazing is a legitimate resource of this area—a badly needed resource. Grazing is being judiciously regulated under the present multiple-use plan, and with the application of sound range management principles, a cattle and sheep harvest—like a timber harvest—can be continued. Under national park management, grazing of livestock is prohibited.

Big game constitutes another legitimate resource of the area—a valuable and much-prized resource. Under Forest Service management

an appreciable annual deer crop can be had indefinitely. Big game has of course a proper aesthetic value; but essentially, big game needs to be harvested annually and in proper degree as a legitimate crop. This is necessary to keep herd numbers in proper balance with forage supply. Big game harvesting is desirable also because the public is allowed to participate in and to share in the harvest.

One of the major objectives of multiple use management of the renewable resources mentioned up to this point is to perpetuate them and, through applied research methods, make them even more permanent and more productive. Under the national park system a game harvest is of necessity precluded.

Mining constitutes another legitimate resource of the area. And the proper promotion of mining, with its attendant income and jobs, in a region of known potential is an interest that an informed public will not readily forego. Mining interests, properly regulated by law as they are now, need not conflict with other resource uses in the area. Moreover, it may add appreciably to the mineral resources of a nation which must look ahead with increasing care to a swiftly mounting population and to the diminution of known sources of supply. Of necessity, mining, regardless of potential, cannot be promoted under the national park system.

These are the main reasons why it would be disadvantageous to the public generally to withdraw the Mt. Wheeler area from multiple use under the Forest Service, and subject it to highly restricted use under the national park system. Moreover, such an action should be objectionable to the Park Service itself, because it would introduce into a system of highly select lands a region without enough qualifications to recommend it adequately as a national park.

I should not conclude an article in which I have set forth my strongest convictions without some accounting for the vital interest I have in the Wheeler Peak issue.

I am vitally interested, first of all, because I have spent a very large part of my life studying and administering public lands. Out of this experience has come a great faith in



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the wisdom of multiple-purpose usage of all public lands, except for areas so highly specialized and unique in nature that there can be no reasonable doubt that it would be wise to put them under the restricted usage the national park system is designed to serve.

Secondly, I have a vital interest in this issue because of a long-standing, intimate, and fond acquaintance with the area itself. I was supervisor of the Nevada National Forest during 1932, 1933, and 1934, and even before the Civilian Conservation Corps program began, I encouraged the purchase of the forty-acre tract marking the opening to the now famous Lehman Caves.

I recall with fond appreciation such names as Chris Roan, Andy Barr, George Doyle, Vail Pittman, Charles Russell, and many others—all public-spirited men, and all key figures in those first early efforts needed to forestall private exploitation of the Lehman Caves and to assure their preservation as a national monument.

It is to all men such as these that I again most hopefully address my

words. For half a century, the multiple-use doctrine has been tested in all of its aspects, and has proved itself good. In consequence, I have no reluctance in saying that multiple use, *except in extraordinary situations*, is the only policy that can serve well enough the important purpose for which it was intended: "Maximum good . . . to the greatest number of people . . . for the longest possible period of time." The Mt. Wheeler area does not constitute such an extraordinary situation.

Even so, I am aware that national park status for the Mt. Wheeler area will capture much public fancy. Over the most impressionable and the least informed it will cast something of a spell. To all such as these it will loom as a *bona fide* case of love at first sight, and hence a love quickly to be espoused. To still others, though it looms as a flattering proposal, it will be something to be thoughtfully weighed. And finally, to the judicious and the well-informed, it will loom as an illicit affair, easy to get into, but burdensome to endure, and once espoused, impossible to shake.

Keeping Forest Insects in Their Place

(From page 38)

guards are being followed.

Little public attention has been given to the intensive cooperative studies conducted by entomologists, fish and wildlife specialists, and others in educational, federal, state, and private organizations during recent years. Many of these studies were headed by scientists of the U. S. Department of Agriculture and the U. S. Department of the Interior's Fish and Wildlife Service.

In Pennsylvania, in connection with aerial spray work, a single aerial application of DDT at one pound per acre had an almost immediate pronounced effect upon many terrestrial insects, with temporary effects lasting about one week. Checks by ornithologists showed that the spray was not harmful to the numerous species of birds present. Studies on large sprayed areas in Canada did not reveal any damage by this dosage to birds.

In a recent press release, the Public Health Service of the U. S. Department of Health, Education and Welfare, the Fish and Wildlife Service of the U. S. Department of the Interior, and the Agricultural Research Service of the U. S. Department of Agriculture had this to say about DDT:

"Tests by scientists of the Fish and Wildlife Service have shown a wide variation in susceptibility to DDT poisoning among the various species of mammals, birds, fish, and other aquatic animals. Numerous studies have demonstrated, however, that mammals and birds will not be harmed by a single aerial treatment of DDT at one pound per acre. Although it is well recognized that small numbers of fish in streams and shallow ponds have been killed by such a spray program, no damaging reduction in fish populations need be feared. Constant efforts are being made to determine correct responsible factors.

"The sharp reduction in the food supply for fish caused by the DDT kill of insects is only temporary. Aquatic insect populations soon build up again in the treated areas as a result of survivors and insect migrations from unsprayed areas."

The Forest Pest Control Act of 1947, under which the Forest Service conducts insect control work, recognizes that forest insects and diseases respect no state line or land boundary. The act is neither mandatory nor regulatory. It provides for federal acceptance of shared responsibility in protecting the nation's forest

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resources from destructive pests. Responsibility for administration of the act is vested in the Secretary of Agriculture, who has delegated this responsibility to the chief of the Forest Service. Under the act, the Forest Service cooperates in the detection, evaluation, and control of outbreaks on private lands, state lands, national forest lands, and other federal lands. Control programs on non-federal lands are accomplished through cooperative agreements with the state forestry agencies.

Under this act, more than 100 outbreaks of destructive bark beetles were controlled by ground methods on state, private, and federal forest lands involving the treatment of 326,600 trees in 1957. Elimination of the bug population in each one of these trees meant one less insect breeding tree for foresters of America to contend with. Likewise, three large epidemics of defoliating insects (spruce budworm) and numerous small ones, covering 1,720,000 acres, were brought under control by aerial application of insecticides during 1957. Before the advent of the airplane and DDT, this would not have been possible.

In a few months, bark beetles can kill a stand of pine, spruce, or fir trees that took 300 or more years to grow. If this were a row crop, it could be replaced in a year. To replace a tree takes generations. If defoliators such as the spruce budworm chew the needles of the trees often enough, they can turn a vast stand of trees into a ghost forest. These and many other stone-hard facts confront the forester. Our ever-growing population is pressing him for more wood, more water, more wildlife, more outdoor recreation.

Let's face it. We cannot eat our cake and have it, too. There is a price to be paid for insect control; and when examined in its true perspective, it is mighty small in comparison with the benefits received.

We recognize that there is some degree of hazard in the use of insecticides. For this reason we are continuing our search for better chemicals and for improved methods of control. We know, also, that when insecticides are used on the broad scale necessary to make control effective, some limited adverse effects may result. However, we hold that in order to provide the greatest over-all benefits and protection to our forest, it is best to accept a limited, carefully analyzed risk to a tiny portion of our natural resources in order to safeguard the whole. When the disastrous and long-lasting effects of an

uncontrolled insect epidemic are weighed against the possibility of temporary upsets of some fish foods and fish populations, the case for chemical control seems overwhelming.

After eleven years of insect spraying, the forester's record is good. He has controlled numerous forest insect epidemics and saved vast areas of forest resources for us and for our heirs. He has done this at a minimum of effect on other forms of life. And while his record today is good, I predict that it will get even better as research and experience bring new advances in forest insect control.

America's Other Face

(From page 15)

major portion of American forests, that today the annual losses comprise only about 3 per cent of those 40 years ago.

Now, I would like to pose this question: Is it not high time for us in the "old world" to start considering whether the policy we have pursued in our forest economy and administration is the proper one? Are we not inclined to accept, as a matter of course, the impact of forests on watershed, erosion, climate, recreation, etc., and therefore to make no special efforts in this direction?

In the United States, on the other hand, the Congress and government, forest research and management, as well as innumerable private organizations, and, in the last analysis, most citizens, have a clear understanding of the fact, that in order to achieve optimum success, never-ending and conscious effort is required. Certainly in our country it is required that forests not be devastated in areas where dams regulate the flow of rivers. In some mountain regions the commercial use of forests is limited, where they serve to check avalanches, and where forests are even designated as "protective forests." Along the Autobahnen, wooded areas are maintained as protective strips by the Park Services to provide a lovely landscape for drivers. But, is that enough?

The necessity for these and other considerations and limitations is fully accepted, but they have no relationship to the economy of forestry. They are not part of a generally accepted concept of forestry policy.

Forestry cannot remain unaffected by the political, economic and technical developments of our times. Let me remind you only of the possible effects, as yet unknown, of the com-



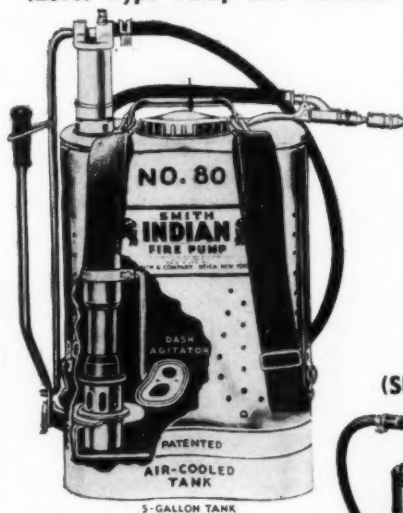
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mon market and the free trade zone in Europe. We cannot as yet predict the exact course of events, although we might describe our future goals as follows: We foresters must maintain the productivity of our forests, and increase it wherever possible, in order that we may satisfy the timber supply for our national economy out of our own production.

I would have been quite satisfied with this formula before my trip to the United States. Today I am tempted to change it slightly. I have been impressed with the fact that forestry is not only important as a branch of the economy, but highly valued for its social aspects. Therefore, I should like to state the following proposition: Our future task will be to maintain and even to increase the productivity, the beauty and the genuinely beneficial social influences of our forests. The purpose should be not only to increase our timber production to the highest possible degree, but also to insure that the forest will fulfill its vital functions of preserving the soil and the water reserve for our nation and its economy, maintaining the landscape, and preserving the health of our nation. That is the guiding principle under which the American public wishes to have its federal forests administered.

The U. S. Forest Service has held to these principles for more than fifty years. It has developed its entire forestry policy, forestry organization and, in the final analysis, all of its work, according to these principles. German forestry, too, could consider all these viewpoints, which are incidental to forestry proper, more than it has in the past, in the realization of political and organizational goals of forestry, for today they are considered unimportant by-products or are lacking altogether. Priority may, for various reasons, in

Germany be different from that in the United States. Financial success may still be considered of primary importance, but the other forest functions demand with increasing urgency their share in our plans. It is our responsibility to recognize their importance and urgency, and to acknowledge that here we are entrusted with a capital with which we have to work, and to work with it in such a way that we shall derive full benefits. Foresters should propose this idea before others do so.

It seemed appropriate to me to bring to your attention the possibility of such an approach which deserves thorough consideration. I have heard and read that the German Forestry Association is about to constitute a new Forestry Policy Development Committee. If this should be done in the near future, I would like to propose that this committee concern itself energetically with the above mentioned considerations. The apprehensions expressed recently by leading foresters confirm my conviction, that we are behind the United States in this area. I could imagine that the old principle would be confirmed anew in dealing closely with this problem: "To do the one and not to omit the other."

This address has been published widely throughout Germany. Whether I will be successful in what I am aiming for remains to be seen. However, I am hopeful, and there are already some encouraging steps being taken. But just as I will always remember my visit with the American foresters, their unbelievably large and great country, my encounter with the other face of America, and the American people, I will also never cease to crusade for a reconciliation of men and nature in Germany, which one day may lead to a somewhat changed pattern of forestry in Germany as well.

Sahara Challenge

(From page 23)

miles an hour with just a finger on the wheel to keep the Desert Humber, a heavy car built for Montgomery and his staff, in a southerly direction, when suddenly we plunged into quicksand which pulled at the front tires. Instantly I gripped the steering wheel, and all of my attention was needed to avoid getting "bogged down" in the bottomless waste. Just at that moment, when my attention was fully occupied, Ray Perry exclaimed, "Skipper, do you see that tree way over there?" We

were about 1200 miles south of Algiers and had not seen a tree for the last 400 miles. But now, as I momentarily glanced at the horizon, I could distinctly see a lone tree in the wide expanse of the Sahara waste. It was away over, and southeast by south, and accordingly I changed my course and drove straight towards it. Said Audley, "Let's stop and identify it." That would have been fatal, for the quicksands were so fine that if we had even slowed down we would have been engulfed. Already

we had noticed wreck after wreck of abandoned cars which had belonged to past expeditions.

I had been warned by Mr. George Hinchcliffe, the famous Sahara driver, who had twice negotiated the Central Sahara on his way from London to Capetown, that when we struck the quicksands we must keep moving at all costs. Therefore, since it was impossible to stop to identify it, Audley got out our Bell and Howell and filmed the lone tree through the windshield of the car as I drove toward it and swung off to continue our southerly direction. When the nightmare of quicksands was negotiated, we rolled to a standstill on a safer surface, where we could relax for a while and thank our lucky stars we had come through the most treacherous stretch of our 2600-mile crossing. Some months later when our film was processed, we found we had a perfect picture of the lone tree of the Sahara, so we took out a frame from the film, and had it made into a stamp to be sold in aid of our green front campaign for "Trees Against the Desert." Thus that lone tree was a symbol of promise, for was it not a true pioneer in the struggle against the limitless desert?

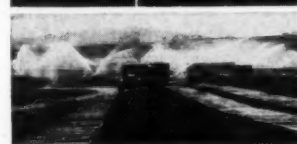
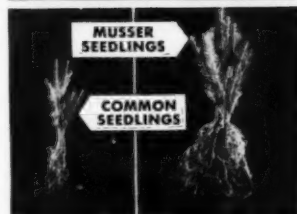
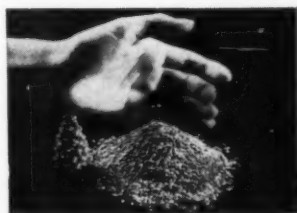
Perhaps the most valuable scientific contribution of the expedition was the discovery of plants growing in a rainless area and having the ability to push moisture into the sand in parts of the desert where even our sensitive dew gauge failed to record any dew at all. One of these plants has been identified as *Coloptera procera*. We first took note of it growing in an area where the average rainfall was from two to zero inches per annum, and where for the past eight years no rain had been recorded. When we came upon it, Ray Perry, our water finder, got excited, as he was sure that there must be a subterranean supply of water at the place where it was growing. We carefully dug up the plant and found that there was plenty of moisture around the root. We dug deeper and came to dry sand. Our conclusion was that this plant was pushing moisture into the ground, and instead of "transpiration" it was a case of "inspiration." There was another plant, belonging to the cucumber family, known as the melon savage. It had a fruit the size of a baseball, which became detached from the plant and rolled over the desert, in time bursting to liberate thousands of seeds, a large percentage of which would germinate.

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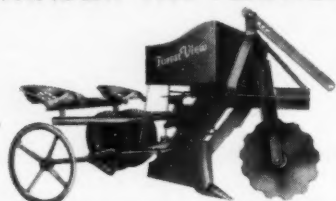
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nate even without any apparent moisture. This, too, pushed water into the ground. The discovery of these two plants opened up a wide field for research in desert reclamation, and augurs well for the future of the newly formed Sahara Reclamation Company, with headquarters in Tangiers, which has been brought into being to provide an avenue through which the many countries that are becoming increasingly interested in desert reclamation may unite in the fight against the deserts, which now threaten the food supply of the world.

The discovery by a French scientist of the Intercalary Continental Aquifer, a subterranean lake 500 miles long and ranging from 50 to 150 miles wide from which water rises with artesian force from a depth of 4000 feet, has put an entirely new complexion on the fight against the desert which, with international cooperation, may yet be won. Electronic apparatus has been utilized for the purpose of dowsing subterranean rivers, and a series of these subterranean rivers have been discovered flowing north from the mountains of the Sudan to the Katara depression. Another series of subterranean rivers are flowing south from the Atlas Mountains into the heart of the Sahara. It is suggested that the first call on a subterranean supply of water will be to create a micro-climate by large scale tree planting. As it is at present, the rain-bearing winds from the sea are dissipated as they pass over the Sa-

haran wastes. If only these winds charged with moisture could be reinforced with transpired moisture from a series of forest plantations, the climate would eventually be altered; clouds would form and precipitate in the form of dew and rain.

A miracle of earth healing can be witnessed today in Israel, where already the dews are returning with the restoration of tree cover, and there is evidence that precipitation is steadily increasing since the hills have been clothed with a green mantle. The large scale elimination of goats is allowing much of the indigenous growth of evergreen forest to return. If the goat population along the northern and western fringes of the Sahara could be similarly reduced there would be sufficient rainfall to permit tree growth. Along the western coastal regions, the rainfall is more than ample, owing to rain-bearing winds having travelled over extensive oceans. Both these regions offer fertile soil. Along the southern boundary of the Sahara, the greatest asset is an extensive natural forest, although it is rapidly receding from French Guinea to the Ruwenzori Mountains on the borders of the Belgian Congo and East Africa. In East Africa itself, there are the great mountains of Uganda and Kenya.

The first logical move in our campaign would be to prevent the further spreading of the desert.

In the north, already a small start has been made by the French in Algiers, with their "banquette" system and reforestation. In Tunisia too, a start has been made by planting areas of acacia. These examples should be imitated, not only along the whole of the north of Africa, but also in a southerly direction along the entire front. The northern line of defense should include the reforestation of the southern slopes of the Atlas Mountains. A token planting has been instigated by an International Forest in Tangier, and demonstrates the feasibility of this method in this region. The Spanish in Morocco perhaps need some help or incentive to encourage them to follow the example of the French. There is no reason why these methods should not be equally successful there and also along the Atlantic coast to the southwest. The aim would be to enlarge and extend the existing forests until they form a continuous barrier, which might then be pushed inwards along the whole front.

For the greater part, the land to the south of the Sahara's indigenous

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forests provides a potential barrier, although where tree cover has been removed there are danger points which must be reinforced. Here it is not so much a question of planting, but more of protection from marauding goats and camels. The rainfall is still sufficient in the southwest to allow the recovery of the high forest if it is given a chance. If the various governments will cooperate in demarcating a continuous forest reserve, from French Guinea through the Gold Coast and Nigeria to Lake Chad, a belt roughly thirty miles deep could soon be established.

I admit that the task I have outlined appears a formidable undertaking, but the world situation is also formidable. In fact, large-scale reforestation of desert has already been achieved and vaster plans are even now in the process of fulfillment over enormous areas of desert.

The American shelter belt from the Canadian border to the Panhandle of Texas was a splendid achievement. In 1947, Russia took up the challenge and by 1957 had completed a 3000-mile shelter belt. In China the people's government has set in operation a gigantic national campaign to replace past deforestation and to fight drought by creating a new great wall—a wall of trees, which will be completed by 1965, and can only be compared in magnitude with the Russian effort.

It is a well known fact that the basic cause of tension in the world today is the result of growing populations and diminishing food and natural resources. The sooner total war is declared on the deserts of the world, the better will be the prospects of world peace. The relentless march of the Sahara is a challenge not only to foresters, but to all men everywhere. To stop it, and push it back along a 20,000-mile front may require an army of 20,000,000 men, and that is equal to the present standing armies of all nations of the world today. Of course, technical experience and leadership will be required, together with scientific knowledge and sympathetic imagination. When tackling such a stupendous task, we must have a sense of values and a detached cosmic outlook. We must be sure, too, that we know that nothing is impossible, but have it in us to say that "the impossible takes a little longer." Let us approach our task deliberately and yet unhurriedly, with a deep conviction that we have the answer to current and future problems, and that time is on our side.

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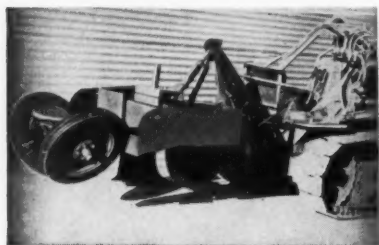
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The River of Grass

(From page 22)

and trees brought by winds, birds, and currents to places in the Glades where humus is richer, and then taking root.

Hammocks may spread over many acres, a tangled knot of vegetation so dense that sunlight seldom reaches the lower branches of the cypress, swamp maples, water oaks, haws, and strangler figs that battle one another for nourishment with jungle ferocity. Most hammocks have never been penetrated by man, but they teem with wildlife, including alligators, turtles, snakes, and insects, and provide rookeries for countless thousands of strange and colorful birds. Here, too, you will see air plants and orchids growing in profusion. Some hammocks have a pond in the center, and are known as "cypress doughnuts."

Except from the air, there is no way to see the real heart of this wilderness. Sometimes a plane crashes deep within the park, and swamp buggies lurch to the rescue. In most of the Everglades the horizon is unlimited for air-boats, a speedy craft driven by an airplane motor and pro-

PELLER, and equally at home in deep water or on "a heavy dew." This is the fleet steed of the "southeast mounties," the rangers who must penetrate this land of water to protect wildlife and read the temperature and rainfall gauges.

Lest you get the notion that the Everglades is so primitive and inaccessible that it cannot be visited and enjoyed by the average visitor, let me insert here that a new and well-surfaced highway penetrates forty miles of the park's open fresh-water sloughs, marshes, and hammocks, ending at Flamingo, a modern fishing and camping resort on Florida Bay. At the far west end of the park, the town of Everglades, on the Gulf of Mexico, offers charter boats for fishing and bird-watching expeditions deep into the mangrove swamps of the park.

Even passing motorists on U.S. 41, the Tamiami Trail, and on U.S. 1, enroute from Miami to Key West, can get a fair idea of the park's broad horizons and its special scenic charm. Some sources of the Everglades' inexhaustible appeal have been described by one who knows the region well:

"... vast, lovely distances where the sky is so much a part of the scenery that the towering clouds are the landscape; milky blue waters and quiet brown pools; warm sunshine filtered among the arching mangrove roots... hurricane thrashed shorelines where delicate vanilla orchids and red-bloomed air plants entwined gray stubs of shattered buttonwoods; the flash of many wings; tousled heads of royal palms protruding high above the forest canopy; the swish of an alligator leaving its mud bank; almost unlimited miles of grasses and sedges..."

Although grass and water dominate the landscape, there are still vast areas of interest to the forester. In addition to the mangroves along the coasts and the palms, cypress, and mahogany of the hammocks, there are a host of sub-tropical plants, bushes, and trees, many of them not found elsewhere in the continental United States. Some came here on the wings of hurricane winds from Cuba and other islands of the West Indies. Others sprang from seeds carried by birds and currents. A very few were planted by man.

Fresh water sloughs and marshes, and coastal swamps, occasionally give way to prairies and pinelands and



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open cypress forests. Here flourish the Florida willow, the small water oak, the laurel oak, sweet bay, hackberry, sweet gum, Florida ash, water locust, Florida elm, and a host of shrubs and vines.

Here too are a number of trees not on the "native" list. Hurricanes and ocean currents have brought in quite a few aliens, including the striking gumbo limbo, with its smooth reddish-brown bark; West Indian mahogany, which has been successfully transplanted as a shade tree in Coral Gables and other Florida cities; ilex; satinwood; cherry laurel; poisonwood; mastic; paradise tree, and numerous others.

Another Everglades — and south Florida — oddity is the so-called "tree fern," which is neither a tree nor a fern, but a cycad, perhaps the oldest of living plants. Its ancestry can be traced back millions of years. In fact, this living fossil would probably be the only present-day vegetation that would be recognized by a dinosaur. The Everglades has three varieties of cycads, and they are the only ones native to the United States, although many foreign varieties have been transplanted to Florida suburban gardens. One native species has thick roots, from which Indians once made a starchy flour.

For the motoring visitor, the park's main entrance is on Florida Route 27, which turns west from U.S. Route 1 thirty miles south of Miami. A modern highway penetrates the edge of the pinelands and, just after crossing the park boundary, you encounter, within a short distance of one another, several markers indicating some fascinating short side trips to be made on foot. Anhinga Trail, Gumbo Limbo Trail, and the Royal Palm ranger station all afford exciting closeups of rare bird and animal life, plus an occasional dozing alligator.

Are the alligators of the Everglades National Park dangerous? This is probably the question most often asked of rangers, and their answer is "Yes." Like the "tame" bears of Yellowstone, the spoiled and pampered alligators of the Everglades now pose a very real threat to unsuspecting tourists and fishermen. As a result of handouts, despite strict park rules against feeding (or teasing) them, alligators have become more of a menace today than when they were truly wild.

Not only are visitors warned that alligators are dangerous on land, but rangers caution fishermen not to dangle their hands or feet over the sides of boats. Anything that comes into

the water is considered a free meal by an alligator, or by his salt-water cousin, the American crocodile. Severe lacerations are the least you can expect when these reptiles make their flash attacks.

Despite their occasionally vicious nature, alligators, like all other living creatures in the park, are protected by law. Fishing is permitted in accordance with state regulations, but hunting, or even display of firearms, is prohibited. Nor may any trees, shrubs, airplants, orchids, or other plants be marred or disturbed. Permits must be obtained by campers before lighting a fire, even in a camp-

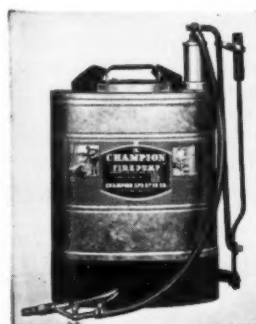
site. Despite the watery nature of most of the park, flash fires are a real hazard, particularly during the height of the winter dry season, which is also the time when most people visit the park.

How do you distinguish an alligator from a crocodile? Guides are tempted to answer, "That is a matter which can only be of interest to alligators and crocodiles." Although the shape of the jaw is different in the two reptiles, they actually look very much alike. A rule-of-thumb means of identification: If they are seen in or near fresh water, they are likely to be alligators; if in or near salt or

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brackish water, probably crocodiles.

Continuing our journey from the eastern gateway, pineland soon gives way to the typical saw grass and hammocks, the prevailing scenery of the Everglades, and merges finally into the mangrove swamps near the sea. Whiskey Creek's name recalls former moonshining operations. Another sign indicates a parking overlook where you can see the rare paurotis palm.

The terminal point at Flamingo, forty miles from the eastern entrance, will surprise anyone who has not seen it in recent years. In place of ramshackle fishermen's huts and crumbling wharves, a modern resort has blossomed in this, the southernmost settlement of the continental United States. Flamingo Lodge is an air-conditioned and heated motel, and the visitor's center features a seafood restaurant, souvenir shop, and cocktail bar operated under lease.

A large marina has slips for 57 boats, with dockside electric power and water. Complete marine supplies, gas, diesel fuel, bait, tackle, and ice are available, as well as small boats with outboard motors. From here the boat-minded explorer can fan out along the rivers, lakes, sloughs, and bays of the mangrove coast or cruise among the scores of isolated keys in Florida Bay. Sightseeing boats make regular trips to Whitewater Bay, an unspoiled backwater dotted with mangrove islands and bird rookeries. Another excursion takes visitors to one of the nation's finest shelling beaches, on Cape Sable.

The western gateway to the park is a five mile highway leading from the Tamiami Trail to the towns of Everglades and Chokoloskee, just outside the park boundary. Access here to the park is entirely by boat. Located in the cypress country and at the edge of the mangrove swamps

and Ten Thousand Islands, the town of Everglades is the main point of departure for fishermen and waterborne tourists and naturalists.

In addition to the town's fleet of charter boats, operated by experienced guides, the National Audubon Society sends out boat tours through the mangrove region and south to the Ten Thousand Islands, including visits to that fabulous dot of land known as Duck Rock.

Only a scant three acres, Duck Rock serves as a roost for about 50,000 graceful white ibis, big black frigate birds, brown pelicans, roseate spoonbills, and cormorants. Twice a day "a blizzard of birds" darkens the sky as squadrons of winged creatures take off and return to their nests.

As one observer described it: "A never-to-be-forgotten sight are the long lines and V's of thousands of white ibis converging on the roosting area. Some are brilliant white as they wing in low against the dark green backdrop of mangrove islands; others swooping and crisscrossing down from the high sky look like a diving swarm of gnats which suddenly materializes into a flash of cascading white wings, riving the air with a rush of feathers.

"A show-stopper is the roseate spoonbill, which flaps in on pink wings as broad as those of an owl. The visitor who remains overnight can see the spontaneous burst of sound and color as thousands of hungry birds pour out of the roost in the first light of dawn."

These are the "spectaculars" of the bird world. The list of others is almost endless. Some, such as the swallow-tailed kite, white-crowned pigeon, and gray kingbird, are seen only during the time when they fly north to nest. But halt along one of the picnic spots on the Tamiami Trail and in no time at all scores of black-glinting Florida crows, purple grackles and red-winged blackbirds will come flapping, creaking and "ker-eeing" around, begging for handouts. Heron and cranes keep a respectful distance, as will also that new addition to the Florida bird world, the cattle egret.

Park officials have discouraged the operation of airboats, except for patrols. But those who wish to experience this thrill of thrills may do so for a modest sum at various airboat "ports" along the canal bordering the Tamiami Trail. By operating north of the trail, airboat concerns can show their patrons Everglades country outside of the park and its jurisdiction, yet give them an idea of what this wilderness is like once

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Suppose we board one of the bigger airboats at Coopertown, fifteen miles west of the city limits of Miami. It seats six passengers in addition to the driver, who sits in a raised seat where he can see well ahead. Behind him are the airplane motor, propeller, and high rudders which maneuver the aluminum-hulled craft.

At first the pace is slow, as the airboat threads its way up a drainage ditch leading off the canal. Then, suddenly, the driver swerves the craft into what seem to be solid banks and guns the motor. Grass breaks on the windshield as the boat forges ahead into a grassy meadow. But always there is water underneath as we spin along, banking to avoid trees and hammocks, gaining speed every minute until the hull seems to be taking off like a seaplane. The old-time roller-coaster is tame compared to this! You try to say something to your companions, but the rush of wind and the roar of the motor drowns out all words.

Then the motor cuts out, and the boat dips to a halt. The sudden silence seems almost oppressive. You look around, and, as far as the eye

can reach there is nothing but watery desolation. "Out of gas," mutters the driver, tinkering with the motor. Your heart sinks, although you can see the mucky bottom a few feet below. But it is just a prank, giving passengers a chance to ask questions, and you are soon bound back to the landing, windblown and with a fuller appreciation of just what the word "wilderness" really means.

What of other wildlife besides fish, reptiles and birds? Since the area has become a national park, with hunting prohibited, many of the area's once scarce living creatures, including deer, wildcats, rabbits, panthers, opossums, bears, otters, and numerous snakes, have made remarkable comebacks. Dragonflies are everywhere, as well as hundreds of other species of insects, particularly mosquitoes.

Because so much of the flora and fauna of the park is tropical or subtropical, do not get the impression that the Everglades is without seasons. The winter season, December 1 to April 30, is something like spring in the north, except that it is dryer, with brief cold snaps and even an occasional frost. Plant life generally remains green; waterfowl, including many migratory birds, cluster in rookeries near tempering water areas.

The summer season, May 1 to November 30, brings sudden brief showers and higher temperatures and humidity. Wildlife is widely distributed and more difficult to see. Fishing, however, is generally at its best during the muggy summer months. The height of the hurricane season is in September and October, but the park has been spared these devastating big blows for several years.

Speaking of fishing, Everglades National Park probably offers more variety than any other public domain, affording as it does both freshwater and saltwater species. King of the fresh-water catches is the large-mouthed black bass, although you will have to land one weighing more than ten pounds to get even a nod from the natives. Bream, pronounced "brim" in Florida and known up north as bluegill sunfish, can easily be hooked with bonnet worms. Stumpknocker, warmouth or goggle eye, red breast, and shellcrackers offer new challenges to the visiting fishermen.

Salt water fishing, which requires no state license, is at its best among the Ten Thousand Islands, facing the Gulf of Mexico. Here, and in the Bay of Florida, trollers, plug casters, fly fishermen, spin rod casters, and cane polers find endless sport.

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Ranch are excellent and will be the headquarters for seven daily rides. There will be a three-day pack trip from a base camp in the Park, which includes a ride to the crest of Mt. Sterling.

Accommodations are limited to a congenial group of 20 riders. Make your reservations early and enjoy the superlative scenery, rushing waters, smoke-blue peaks, and flame azaleas, laurel, iris and dogwood. \$200 from Asheville, North Carolina.

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You name it—tarpon, snook, channel bass, bonita, kingfish, marlin, red snapper—these and many others are to be had even by beginners, granted of course that you choose the right time and perhaps a skilled guide who can take you to the best reefs, banks, and "holes." All told, there are more than 600 species of salt water fish in Florida waters, and many of them range in the offshore waters of the Everglades Park.

Yes, in the air, on the surface, and under the surface, the whole world of the Everglades hums and glistens and tingles with life. Most significant of all, there is no other "Everglades" in the world—it is one of the unique regions of the earth, remote and lonely, a challenge and a mystery to man that shall probably always remain inviolate.

Wooden Barrels

(From page 27)

ing horses and oxen for the farm and for the neighboring community.

Over the carpenter's bench hung woodworking planes of various sizes, drawshaves, hatchets, augers, and adzes. In the center of the floor stood a wooden shavehorse, complete with "saddle," for the barrelmaker's particular use.

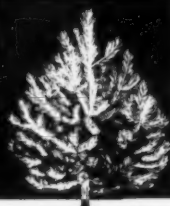
Seasoned staves in sufficient quantity for making an individual barrel were placed in a steam box for two to three hours in order to make them pliable. This box, in turn, fitted into the fireplace just under the granite topstone. Such a box, about five feet long and one foot square, was closed tightly by a heavy cover to keep in the steam.

A soldered pipe extended from this cover to an iron kettle hung from a crane over the fire, thus conducting the steam into the steam box. From this box, the barrelwright took the softened stave, then "rode the shave horse," placing one end of the stave in the wooden jaw in front of him, and holding it tightly by means of a foot pedal which locked to the wooden end.

Now with a plane he reduced the thickness of the square stave edges, thinning the wood more on either side than in the middle. A second plane bevelled the stave edges so that they would fit exactly when assembled into the cask, the bevel being smaller on the inside than on the outside.

That part of the stave that projected above the barrelhead and below the barrel bottom was known as

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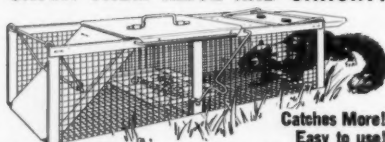
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the chime. The staves, in turn, fitted into a V-shaped groove called a croze. The heads were made in three sections, cut vertically across the circumference, with wooden dowels fastening the pieces together. In addition, the head was chamfered or bevelled around the edges after having been cut to size to fit the croze.

Staves, heads, and hoops were assembled preparatory to completing the barrel itself. The staves, set in a bottom hoop made fast to a frame in the floor, were stood up in order. Then another hoop was slipped inside the staves—one a little smaller than the outside ring. This created a circular slot, holding the ends of the staves firm, with another hoop driven down to hold the staves in position. Now the barrel was reversed and a similar procedure followed.

The barrel being completed, the head was made fast in the groove by slipping on the lowest and highest hoops to hold the staves tightly in place.

After the bottom, middle, and top hoops had been firmly anchored in place, the craftsman moved the barrel to the work bench. Here a rope attached to a winch and fastened around the staves drew the staves tightly together. The looser, temporary hoops now fell off, the bottom barrelhead was forced in, and several permanent hoops were slipped over the staves, with locks or ratchets to hold them fast. Next an assistant hammered the staves with a wooden beetle, pushing the top head into place.

The well-seasoned hoops which encircled the cooperage products came from the saplings called hoop-poles, cut in the fall and winter, left to season for a period, then brought into the shop to be worked up before the barrel-making began.

First, the hoop-poles were split lengthwise. Then a hoop-pole shaver sat astride the shave horse, moving a lever which held one end of the hoop to the horse. Bending forward, he pulled a two-handled, sharp-edged knife or drawshave across the flat surface of the curved pole, smoothing it off but leaving the underside rounded with the bark untouched.

These hoops, properly notched and tied with hemp rope into bundles of one hundred, were steamed in the steam box which later would steam and soften the barrel-staves. This process completed making the barrel.

Barrels made in the 1800's and earlier held the following number of gallons:

Firkin _____ 8

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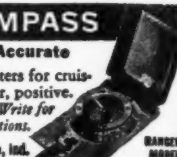
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Hogshead	63
Puncheon	84
Butt	126
Pipe	168
Tun	336

District school arithmetics of the first decade of the 1800's devoted an entire section to problems involving "gauging"—that is, taking the dimensions of a barrel in inches in order to find its contents in gallons. Here is the process:

Add two-thirds of the *difference* between the head and bung diameters to the head diameter to determine the mean diameter. If the staves curve but little from the head to the bung, add only 6/10 of the difference.

Next, square the mean diameter; multiply it by the length of the cask; divide the product by 294 for wine measure; 359 for ale measure. The quotient will be the answer in gallons.

In taking the length of the cask, however, allowance must be made for the thickness of both barrel-heads of 1, 1 1/2, or 2 inches, according to the size of the cask.

The head diameter must be taken close to the chimes. For small casks, add 3/10 of an inch; for casks of 40 to 50 gallons, 4/10; and for larger casks, 5/10 or 6/10. The sum will approximate the diameter within.

Farm cooper shops functioned in rural New England communities from 1800 to 1900. After the turn of the century, factories took over this farm industry which had become neither practical nor profitable. Once and for all, the barrel had really been thrown out of the cooperage. The cooper shop had become a victim of progress. Wooden barrels from New England forests were now machine-made.

Forester's Notebook

(From page 8)

lands, such as national parks, national forests, and wildlife refuges. In recent years the federal government has leased or sold many such tracts to people who want to 'get away from it all.' This law is one of the means whereby people may do this; the mining laws are not."

Anyone with an interest in acquiring a portion of the public domain under any of the land laws should request detailed information from the Bureau of Land Management, Department of the Interior, Washington 25, D. C.



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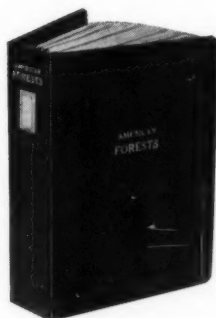
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Reorganization

The quiet accomplishments of inter-agency committees often go unnoticed amid the fanfare of commission reports. Yet the efficiency of public administration is being improved progressively, albeit somewhat slowly.

In November 1958, the National Park Service, the Bureau of Land Management and the state of Montana completed a three-way swap of lands valued at \$1,600,000. NPS consolidated federal ownership inside Glacier National Park by acquiring 9,353 acres of state land in exchange for 168,000 acres of Taylor Grazing Land in 16 Montana counties.

In the same month, the Forest Service made available 200 acres adjoining Yosemite National Park so that the housekeeping functions of park administration could be separated from scenic attractions. The Park Service augmented this move

scattered and intermingled ownerships present a major obstacle to efficient administration of forest and range lands. When federal and state agencies voluntarily seek more efficient administrative procedures, they should be commended for their efforts and urged to continue the search.

Indian Forests

During the past decade, the cash income from Indian-owned forests has increased from \$2,500,000 to \$8,500,000 annually. These receipts, less a 10 per cent charge to defray timber sale administration costs of the federal government, go to the Indian owners.

Indian forests, scattered among 78 reservations in 23 states, contain 5,965,320 acres of commercial forest land with a net volume of nearly 30 billion board feet of timber. This does not include the land now being

Ten Most Heavily Timbered Indian Reservations, Klamath Excluded

Reservation	State	Commercial Forests Acres	Net Volume Board Measure
			Billion B.M.
Warm Springs	Oregon	330,253	5.1
Yakima	Washington	415,390	3.7
Fort Apache	Arizona	453,117	3.5
Colville	Washington	966,562	2.9
Navajo	Arizona, New Mexico, Utah	476,616	2.7
Hoop Valley	California	72,586	1.6
Menominee	Wisconsin	213,130	1.6
Flathead	Montana	379,800	1.1
Red Lake	Minnesota	365,947	0.8
Mescalero	New Mexico	188,942	0.5

by purchase of 972 acres of contiguous land from the El Portal Mining Company. Warehouses, ranger dwellings, and other service facilities now are being moved outside the park.

In December 1958, federal grazing administration in Montana was simplified by transfer of 1,935,853 acres of LU lands from the Forest Service to the Bureau of Land Management. These tracts are intermingled with Taylor Grazing Land being administered by BLM.

Initially the LU lands were submarginal farms, purchased by the Resettlement Administration during the depression under the Land Utilization Project. They were restored to grazing use by the Soil Conservation Service and turned over to Forest Service administration several years ago.

Landownership studies being conducted in other states by The American Forestry Association reveal that

disposed of for the Klamath tribe.

Other Indian tribes also own 7,481,350 acres classed as noncommercial forest (i.e., not capable of producing a merchantable stand of marketable timber by present-day utilization standards).

Recently revised federal regulations will permit Indian forest owners to have a right of appeal from Indian Bureau decisions on timber sale contracts. Other revisions, made simultaneously, provide:

1. For the first time it would be a stated goal of Indian forest management to preserve and develop grazing, wildlife and other values to the extent it would be in the best interests of the Indian landowners.

2. A sustained yield of timber would continue to be emphasized. However, Indian lands requiring such management would be defined for the first time as lands chiefly valuable for forest crop production

or on which a forest cover is needed to protect watershed or other values. Lands better suited for farming or other purposes would not be included.

3. A number of detailed changes would be made in the sales procedures to bring them into greater conformity with those of the Forest Service and the Bureau of Land Management.

4. The revised regulations would make it easier for the Indian owner of a forested tract to cut and sell timber from his own land. Under the present rules, Indian owners are allowed to cut timber for their own use but not for sale.

DAR Conservationists

Ethel Turlington Mills, chairman, North Carolina Conservation Committee, Daughters of the American Revolution, stirred up so much interest among her associates that 82 of the state's 85 chapters conducted active conservation programs. Many chapters emphasized work with young people.

Their accomplishments included the planting of 659,030 seedlings; the establishment of permanent pastures on 1,882 acres; construction of 41 irrigation systems; impoundment of 120 ponds; contouring 3,386 acres for soil conservation; and creation of 44 wildlife sanctuaries covering 730 acres.

Water resource conservation benefited from the efforts of 38 chapters. One successfully supported legislation for a new water tank and sewer system. Another helped its city build a watershed. A third chapter cooperated in building dams along a creek.

Busy Acre

On a square acre near Quinalt, Washington, Norman P. Worthington of the Forest Service, found 31 Douglasfirs and 28 hemlocks that have added a mean annual increment of 1041 board feet throughout the forest's 375 years.

This example represents an extreme case of high productivity under very favorable growing conditions.

The total volume, 390,000 board feet—a near record—is enough for construction of 39 five-room frame houses.

Individual Douglasfirs range from 46 to 78 inches in diameter at breast height and are 285 feet tall.

Pine Needles

Pine trees produce their needles in 2's, 3's, and 5's per fascicle (bundle) and the number usually is constant throughout the tree. This trait is one guide to identification of the

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different kinds of pines. But some
people have been mystified to find
varying numbers of needles per fas-
cicle in different portions of the same
tree.

Dr. Elbert L. Little, Jr., dendrol-
ogist for the U. S. Forest Service,
comments upon this phenomenon
as follows:

"Though the number of needles
in a fascicle is constant or nearly so
in many species of pines, other spe-
cies, including longleaf pine, have
some variation in this characteristic.
A few explanations suggested for
pines in general may be applicable
to this species. Within limits the
number of needles is hereditary. For
example, when a pine with 3 needles
is crossed with another species, hav-
ing 5, the hybrid will have 4's, 3's,
and 5's. Sometimes a vigorous tree
of a species with needles in 2's and
3's will have needles mostly of the
larger number, 3, as well as longer.
Also, a few subtropical pines will
tend to have more and longer
needles in a fascicle, especially
southward. For example in Mexico
there are hard pines with 5 needles
in a fascicle, or sometimes 6, 7, or 8."

Reading About Resources

(From page 39)

Here are the twenty-six papers
presented in Washington in early
1958, at a series of forums sponsored
by Resources for the Future. The re-
sulting anthology, to change meta-
phors in the middle of a review, is
like a diversified portfolio of securi-
ties: some are AAA, safe for the most
poorly paid professors; some are B,
speculative for professors; and others
are a risky C, strictly for the adven-
turous business man.

Robert C. Cook, of the influential
Population Reference Bureau, for
example, gives a spirited defense of
neo-Malthusianism which should be
required reading for doubters. John
Kenneth Galbraith, of **The Affluent
Society** fame, contributes an excel-
lent piece, "How Much Should A
Country Consume?" Bushrod W. Al-
lin is perceptive in writing of "The
Waning Role of Laissez Faire."

There are other solid contribu-
tions—more than usual in an anthol-
ogy—for Resources for the Future
was shrewd in choosing its partici-
pants. Yet there is no unity and no
central impact. The book does not
have a "message," and we could hard-
ly expect one under the circum-
stances. Here is material that be-
longs in a magazine, albeit a good
one. That we find the pieces gath-



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ered into a book should not detract from the pieces themselves, whatever one may think of the judgment of publishing in this form.

At the other end of the publishing spectrum is **Our Forest Heritage**, edited from material of the late William Robinson Brown (New Hampshire Historical Society, Concord, 1958. 333 pp. \$5.00). Mr. Brown was a member of the New Hampshire Forestry Commission for over 40 years.

Here is "A History of Forestry and Recreation in New Hampshire"—which is one way of describing a book of limited appeal. Yet within this provincial framework there is material of vigor and attractiveness. The writing is straightforward and honest. As regional reporting, it is top-drawer. Such a chapter as "Camps, Logging and River Driving in 1900" tells us things about the sleeping habits of the men who went into the forests to move the timber that make for excellent reading, however little importance you may attach to sleeping habits. Often the book is humorous. There are pages as exciting as a novel.

Mr. Brown, it might be added, is occasionally very much up to date, as on page 181, where he states his position in the very current wilderness debate:

"The mistaken idea sometimes fol-

lowed by would-be conservationists of preserving wilderness areas unattended for the protection of mountain scenery and similar purposes, accompanied by the exclusion of trampers, while not as dangerous as clear cutting with no provision for future growth, defeats its purpose. The maintenance of a healthy growing forest is dependent on the removal of dead, dying and down trees that breed insects and other pests to attack that owner's healthy trees and the trees of others. Also a forest that is interlaced with fire lanes to allow access to travelers and fire fighters, and where the underbrush is cleared up is far safer as a fire risk and more sure of a long life. With human nature as it is, well-kept forests that yield a regular income to future owners as a good investment, are far more sure of a happy old age."

Whatever one may think of this opinion, there is no doubt but that it was the sincere viewpoint of a capable and experienced forester.

A far less substantial book, though one which will unquestionably have a wide sale, is Jack McCormick's **The Living Forest** (Harper & Bros., N.Y., in cooperation with the American Museum of Natural History, 1959. 127 pp. \$3.95). This is an attractive introduction to forest ecology for laymen and literate children, published as a supplement to the

splendid Hall of North American Forests in the museum. The hall itself is the brilliant work of a half-dozen men. Richard H. Pough deserves particular credit for the unforgettable exhibits.

What the Hall of North American Forests preserves in make-believe, that fabulous gentleman, George Perkins Marsh, struggled with imagination and courage to preserve in reality: the forests of the continent. An excellent biography of Marsh is available now, and this is important. David Lowenthal has written **George Perkins Marsh, Versatile Vermonter** (Columbia University Press, N.Y., 1958. 442 pp. \$6.50). The author of **Man and Nature** is ignored by these swift-moving times. Marsh died in '82, which makes him almost ancient history. Yet in the eyes of many he remains the First Conservationist. While this distinction might never fit any man well, it hangs no more awkwardly on Marsh than on any other. And Lowenthal's book is a satisfactory exposition of this incredible human being who was so profoundly concerned with man's relation to the natural world—as well as with a half-dozen other equally large subjects. Marsh's mind, and his soul, would have been broad in any age, and the book is a stimulant that is good in these cold, dark months of winter.

Let's Go to the Glacier

(From page 25)

recreation for every member of the family.

On this sunny Sunday, the children enthusiastically cleared the breakfast table and washed the dishes while I packed a picnic lunch and stirred up a custard for ice cream. We packed our old hand-cranked ice cream freezer into the car with the swimming suits, guns, shovels, buckets, and picnic basket, because homemade ice cream is part of a glacier picnic.

Glacier ice is diamond-clear and long lasting. From time to time, various Juneautes have made a living harvesting the icebergs floating on Mendenhall Lake and selling them to restaurants and housewives. They have even shipped the centuries-old ice as far away as New York and Honolulu to chill bowls of punch.

The first thing we do when we picnic at the glacier is to pick up a few chunks of ice along the shores of the lake. Curt, my husband, breaks them up and the boys take turns cranking the ice cream freezer. This day, the ice cream was frozen in a

few minutes and we packed it away to "ripen" while we drove a short distance to Dredge Lake.

During World War II, the Army built a camp near here, and dredged sand and gravel from Mendenhall Valley for building roads to ammunition dumps, concealed among the alders and cottonwoods that shelter the young evergreen forest springing up on the silt and sand deposited by the glacier. The shallow hole they dredged soon filled with water. Warmer than Mendenhall Lake or the salt water at nearby beaches, it has become a favorite swimming hole for Juneau youngsters.

After a swim, we lunched on sandwiches, homemade ice cream, and lemonade chilled with glacier ice. Then Allen trudged off with Cappy, our beagle hound, in search of rabbits. Roger and his father took the shotgun and some targets to the rifle range which the Forest Service maintains for local sportsmen in an isolated spot parallel to the glacier.

Sally and I headed in the other direction, around the edge of the lake where growth is creeping over

the ground most recently uncovered by the ice. Here chilling winds blowing across the glacier keep the valley several degrees colder than in the nearby area. Plants and shrubs growing here are similar to those found in alpine valleys. There are prostrate willows and azaleas, mountain hemlocks, dwarf flowers, and creeping evergreen shrubs with waxy yellow and white blossoms. Without having to climb mountains, I've been able to fill my rock garden with alpine plants. Sally and I filled a box with them by the time the boys and Curt were through shooting.

The mountains climb sharply on the west side of the glacier and a steep trail follows the ice up the ridge. A more gradual trail on the east side winds over rounding hills and protruding rocks ground smooth by action of the ice. This is where buses from town bring tourists to view the glacier and photograph the ancient ice. You can look into glittering indigo caves which become exposed as the icebergs drop from the ever-changing face of the glacier. Though we've visited it many times,

we never tire of photographing it, because it changes from day to day.

There are several streams and pools of water where the action of the ice has gouged into the earth. In the summer, these clear pools and streams are filled with salmon completing their life cycle by fighting their way upstream to spawn in the same place where they began their lives. In the winter, when Dredge Lake has frozen hard enough for skating, we've seen the little minnows swimming beneath the frozen surface. Here the children have been able to learn about the constancy of Nature, and wonder at the instinct that brings the salmon home to spawn and die.

This Sunday, we decided on the more vigorous hike up the west side of the glacier. As we climbed along the edge of the ice, inquisitive squirrels whuffed at us from the side of the path, and we caught a glimpse of a porcupine scuttling clumsily into the brush. Goats can be seen occasionally far up the mountain sides. We looked behind us down the valley on fields of blue lupine and wild iris, polka-dotted with creamy patches of the fluffy cotton grass that we pick to save for winter bouquets.

In the fall, icy winds turn the valley's cottonwoods a blazing yellow. These are usually the only autumn leaves we see around Juneau. Trees away from the valley are sheltered from the chilly winds which sweep down from the ice cap. Their leaves wither and are blown off before autumn frosts have a chance to turn them the rich reds and fiery oranges which I had

gathered in the Pacific Northwest before I came to Alaska.

Looking down, we could see the sturdy little evergreens which haven't yet grown into a forest. This is our favorite hunting ground for Christmas trees, and we never fail to find a symmetrical spruce for our holidays, though we've sometimes had to don snowshoes to tramp through three-foot drifts away from the road to cut one.

Christmas was far from our thoughts on this summer Sunday, but the glacier is our winter playground as well as the scene of our summer fun. When the temperature plummets and the lakes freeze over, they are ideal for ice skating. We skim in and out between the icebergs imprisoned in the ice of Mendenhall Lake, and cars drive across the surface pulling sleds loaded with squealing youngsters. The iceman drives his truck up to a likely-looking berg and chops off chunks to sell in town, instead of having to haul it to shore in a skiff as he does in summer.

In the winter, the Skater's Cabin, an attractive stone and log structure maintained by the Forest Service, is the center of our activities and the scene of many get-togethers. We make popcorn and drink hot chocolate by the flickering light of the fireplace and the aurora borealis wavering above the glacier. The grimy moraines in the ice are covered with the angel-whiteness of freshly fallen snow. The bright greens of spring and summer and the gold and bronze of autumn are gone, and the snow glitters in the moonlight and crunches under our feet.

But our summer Sunday excursion wasn't over. I gave each of the children a pail and sent them in search of wild blueberries, cautioning them to put at least as many in the pails as they did in their mouths, because I wanted some to freeze for winter pies. Then Curt and I hunted among the mossy patches under the trees for mushrooms. Several edible varieties grow here, and can be found from the middle of the summer until the first fall frost.

As the sun sank lower toward the western peaks, we headed the car toward Mendenhall River, which flows from the lake to Auke Bay about two miles away. The silt-laden water tumbles over glacial rocks between banks of cream-colored sand. Whenever we are near the glacier, Curt takes a few buckets of sand home for concrete work, as we always seem to have some project in progress. Once it was a wall of speckled glacial granite; once it was garden steps made from slabs of slate we'd picked up along the beaches. Now it was an outdoor fireplace we were building.

This glacier-ground sand is cleaner and finer than the rocky gray sand of Alaska's salt-water beaches. The children have a large, rock-rimmed sand pile at home filled with the pristine sand.

The sun still shone brightly—it wouldn't set until eleven o'clock at this latitude—and an evening breeze rippled the ice-spotted surface of the lake when we finally headed home, each of us having found something to intrigue and satisfy him in our day at the glacier.

Forest Forum

(From page 4)

Commission," as it is commonly known, and a report of last summer from the Department of Agriculture make it clear that further research and pilot study work on the cold soda process is needed in respect to its utilization with northern hardwoods. This, of course, is at variance with the report in your magazine that "the technology to be proved by the pilot plant had already been proved and placed in commercial operation." I have discussed this project at length in an article appearing soon in PULP & PAPER JOURNAL. The article is being reprinted in the record of the Small Business Committee hearings and your readers can obtain it there if they miss the opportunity of seeing it in PULP & PAPER JOURNAL. I am enclosing a copy herewith for your own information.

William Proxmire,
United States Senator
Wisconsin

(In checking up, we find that Mr. Hall did not report in his December column that the meeting in Superior was held "to generate support" for legislation to estab-

lish a program of price reporting for forest products. What he did say was that "Senator Proxmire has already used the first of a series of hearings on small forest business, held by the Senate Small Business Committee, to generate support for the bill." As reported by both forestry observers and the press, opposition developed to price reporting at the Superior hearing. One member sent us a clip from the Superior newspaper which carried a three-column head, "Loggers Not Certain They Want Help, Senator Finds at the Hearing." Another member said this opposition could be boiled down to the statement "Please leave us alone." Other witnesses, among them representatives of labor, indicated a need for increased federal government activity in price reporting and other market information services and in the establishment of a pilot newsplant for the utilization of hardwoods. That Senator Proxmire apparently rather thoroughly subscribes to the union approach here was borne out when he reportedly went on a television program a few hours after the hearing to report that

it had confirmed his belief that a program of price reporting and for a federal pilot plant are necessary. This is what Mr. Hall meant when he said the Senator used the hearing to generate support for his program. In reference to the cold soda process, it is our understanding that Forest Service research to be released around March may shed new light on this process as it applies to Wisconsin. As used in the South, it involves a careful mixture of both hardwoods and softwoods, so we are informed. This is due to the fact that the short fibers of hardwoods to date have not produced good newsprint economically unless mixed with the long-fibered softwoods. This would seem to raise such questions as to whether both hardwoods and softwoods are available in sufficient quantities in Wisconsin, or, on the other hand, if good quality newsprint from hardwoods alone can be produced economically on high speed machines. These are technical questions, we must confess, about which we know little but it sounds like an interesting subject to explore more fully in the future. — Editor)

EDITOR:

Enclosed is a clipping from the Friday, November 14, 1958 issue of the *Evening Telegram* of Superior, Wisconsin.

Evidently the loggers do not feel that the government should hold their hands for them; that you will not, cannot get something for nothing.

Robert A. Bailey
Saron, Wisconsin

Crusading Missionary

DEAR MR. HORNADAY:

I am a lay missionary presently connected with the Santo Niño Missions at Aragon, New Mexico. I am also a member of The American Forestry Association, and I heartily endorse the stand of your association on the Wilderness Bill. You may be sure that you are well remembered in my Daily Holy Mass, and may your resolve and courage be ever strengthened.

Frederick F. Kirsch, L.M.
Santo Niño Church
Aragon, New Mexico

Water Balance

EDITOR:

Your December issue of *AMERICAN FORESTS* gives sufficient recognition to watershed management to list it among such other methods of developing water as: inter-regional transfer of water, weather modification and control, recharge and planned uses of underground aquifers, increased efficiency in use and recovery of

water, and demineralization of saline and brackish water. Except for demineralization, we have different organizations and agencies in Arizona working on all these phases of water management. So with watershed management now in the picture, Arizona has an excellent opportunity to point the way in coordinating various facets of water management towards the goal of achieving the best balance between available water supplies and population demands.

By encouraging such practices as thinning and pruning, I agree with those foresters who recognize in our program an opportunity to advance forestry in the Southwest from extensive to intensive management. . .

Joseph F. Arnold
State Land Department
Phoenix, Arizona

Liked December Issue

EDITOR:

The December issue of *AMERICAN FORESTS* was, in my opinion the best ever. So many thoughts expressed during the meeting in Arizona were top-notch.

We, here in New Jersey, also have a water question. We did a lot of campaigning to get a referendum through for water preservation in this state. The amount granted was \$47 million to build two reservoirs and do research work, especially on ground water.

Henry F. Bosenberg
Livingston Park
North Brunswick, N. J.

Fifth World Forestry Congress

(From page 7)

per, Executive Secretary, Society of American Foresters, Washington, D. C.; Kenneth Davis, Western Director, United Brotherhood of Carpenters, Portland, Ore.; Dwight B. Demeritt, Vice President, Dead River Co., Bangor, Maine; Mortimer B. Doyle, Executive Vice President, National Lumber Manufacturers Association, Washington, D. C.; Ursula Duffus, Office of International Economic and Social Affairs, Department of State; Paul M. Dunn, Technical Director of Forestry, St. Regis Paper Co., New York, N. Y.; W. Jeter Eason, President, Forest Products Research Society, Memphis, Tenn.; Alfred E. Fivaz, Forest Products Division, Department of Commerce; Edelen Fogarty, Office of International Resources, Department of State; Tom Gill, Executive Director, Charles Lathrop Pack Forestry Foundation, Washington, D. C.; V. L. Harper, Assistant Chief, Forest Service, Department of Agriculture; Albert F. Hartung, President, International Woodworkers of America, Portland, Ore.; Edwin F. Heacox, Managing Forester, Weyerhaeuser Timber Co., Tacoma, Wash.; James H. Kitchens, Jr., President, Council of Forestry Association Executives, Alexandria, La.; Walter M. Leuthold, President, Deer Park Pine Industries, Inc., Deer Park, Wash.; Joseph E. McCaffrey, Vice President,

International Paper Co., Mobile, Ala.; Gordon D. Marckworth, Dean, College of Forestry, University of Washington, Seattle; David Mason, President, Mason, Bruce and Girard, Portland, Ore.; Robert E. O'Connor, Executive Secretary, American Paper and Pulp Assn., New York, N. Y.; Kenneth B. Pomeroy, Chief Forester, American Forestry Association, Washington, D. C.; Harry V. Ryder, Jr., Office of International Conferences, Department of State; O. Harry Schrader, Jr., General Manager, Northwest Division, United States Plywood Corp., Seattle, Wash.; John F. Shanklin, Technical Review Staff, Office of the Secretary, Department of Interior; Hardy L. Shirley, Dean, College of Forestry, State University of New York, Syracuse; Richard W. Smith, Manager, Natural Resources Department, Chamber of Commerce of the United States, Washington, D. C.; Edward P. Stamm, Consultant, Crown Zellerbach Corp., Portland, Ore.; John B. Veach, President, American Forest Products Industries, Asheville, N. C.; Corydon Wagner, Vice President, St. Paul and Tacoma Lumber Co., Tacoma, Wash.; Lloyd T. Webster, State Supervisor of Forestry, Department of Natural Resources, Olympia, Wash.; Charles L. Wheeler, Vice President, Pope and Talbot, Inc., San Francisco, Calif.

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perspective on nature



THE LIVING FOREST

By JACK McCORMICK, American Museum of Natural History. This book derives from the most comprehensive exhibit of its kind in the world—the new Hall of North American Forests at the American Museum, with whose cooperation *The Living Forest* is published. In words and pictures it reveals our forests as the constantly changing products of many influences — climate, soil, animal activity, natural and man-made hazards, etc. With over 40 photographs and 90 drawings and diagrams by Mathew Kalmenoff.

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Photos used on this page will be of unusual rather than esthetic qualities and subject matter will be restricted to scenes, events, objects or persons related to the use, enjoyment or unique aspects of our renewable natural resources. For each picture selected, AMERICAN FORESTS will pay \$10

Photo submitted by Robert H. Forbes, Vancouver, B. C., Canada



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